PROCEEDINGS

OF THE

MADRAS GOVERNMENT

IN THE

PUBLIC WORKS DEPARTMENT.

IRRIGATION BRANCH,

FOR THE

MONTH OF APRIL 1892.

Printed by Authority.

MADRAS:
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1892.

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GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

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1 Subjects.	2 Dates of Proceedings.	3 Date of Report to Secretary of State for India.	4 Numbers and Dates of previous Proceedings.
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PUBLIC WORKS DEPARTMENT,

IRRIGATION BRANCH.

PROCEEDINGS OF THE MADRAS GOVERNMENT,

FOR THE MONTH OF APRIL 1892.

Irrigation.
Account.

READ—the following papers :—

Office-note from Examiner, Public Works Accounts, dated	24th Nov. 1891,	No. 7267.
To Superintending Engineer, VI Circle	„ 27th „ „	„ 5346 C.
From „ „ „	„ 21st Dec. „	„ 575 P.R.
Office-note from Examiner, Public Works Accounts	„ 3rd Feb. 1892,	„ 184 S.A.
To Superintending Engineer, VI Circle	„ 12th „ „	„ 734 C.

From Lieut.-Colonel A. C. SMITH, R.E., Superintending Engineer, VI Circle, to the Chief Engineer, Public Works Department, dated Trichinopoly, 14th March 1892, No. 705 P.R.

With reference to your memo. No. 734 C. of the 12th February 1892, calling for report as to why the estimates for four inlets and outlets in the 7th Reach of the Periyár main channel have been revised while the project estimates contain provision for only three inlets and outlets, I have the honour to refer you to this office No. 575 P.R., dated 21st December 1891. on the subject and to request that the estimate of Rs. 3,300 for constructing a culvert in the 7th Reach sanctioned in G.O., No. 824 I., dated 24th October 1891, may be cancelled.

2. A copy of the Executive Engineer's letter No. 398 of the 3rd instant on the subject is enclosed for your information.

Office-note from the Examiner, Public Works Accounts, dated Madras, 18th March 1892, No. 409 S.A.

With reference to G.O., No. 166 I., dated 19th February 1892, I would point out that the balance for unforeseen works, Periyár Project, should be Rs. 2,49,021 instead of Rs. 2,58,101. The difference, viz., Rs. 9,080, which was noticed in my office-note No. 184 S.A., dated 3rd February 1892, as requiring to be deducted from unforeseen works, does not appear to have been taken into account. May I reckon upon Rs. 2,49,021 as representing the correct balance under unforeseen works of the Periyár Project ?

ORDER—dated 4th April 1892, No. 345 I., Public Works.

The sanction accorded in G.O., No. 824 I., dated 24th October 1891, to the estimate of Rs. 3,300 for constructing a culvert in the 7th Reach of the Periyár main channel at 24 miles 7 furlongs and 552 feet is cancelled, and the balance available for unforeseen works of the Periyár Project will be reduced by Rs. 9,080, the amount of saving credited thereto in the order referred to. The balance now available is Rs. 2,26,244.

(True Extract.)

(Signed) J. PENNYCUICK, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, VI Circle.
,, Examiner, Public Works Accounts.
,, Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1892} Madras.

PUBLIC WORKS.

Dated April, 4th.

Recd *Encl.*

G.O., 4th April 1892, No. 345 I.

APRIL.

Periyar Project

Sanction accorded to the estimate of Rs. 3,300 for constructing a culvert in the 7th Reach of the Periyár main channel at 24 miles 7 furlongs and 552 feet, cancelled with remarks.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

From W. B. DEWINTON, Esq., Superintendent of Works, No. I Periyár Division, to the Chief Engineer, Public Works Department, dated Periyár, 25th March 1892, No. 286 C.E.

I have the honour to submit herewith an estimate, amounting to Rs. 5,300, for purchasing tipping waggons, indented for and supplied from England for the Periyár Project works in April 1891, and to request that you will be good enough to obtain the sanction of Government to the same.

ORDER—dated 4th April 1892, No. 346 I., Public Works.

The following estimate is sanctioned from the balance of the amount reserved for tools and plant of the Periyár Project, which will then be reduced to Rs. 14,460 :—

Major Works (Construction).
49. Irrigation.
Periyár Project.
III. Tools and Plant.
12. Miscellaneous.

Purchasing tipping waggons, estimate ... ... Rs. 5,300

2. This sanction is registered as No. 1 I. of 1892–93.

(True Extract.)

(Signed) J. PENNYCUICK, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Chief Engineer for Irrigation.
" Superintendent of Works, No. I Periyár Division,
with one enclosure.
" Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Govt. of {1892} Madras.

PUBLIC WORKS.

Dated April, 4th.

Recd. *Encl.*

G.O., 4th April 1892, No. 346 I.

APRIL.

Tipping Waggons

Estimate of Rs. 5,300 for purchasing — for use in No. I Periyár Division, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

From Lieut.-Colonel D. McNEIL CAMPBELL, R.E., Superintending Engineer, V Circle, to the Chief Engineer for Irrigation, dated Chepâk, 19th March 1892, No. 91 E.I.

I have the honour to submit, for sanction, plans and estimates with necessary accompaniments as per margin for the following works :—

Kunnavakkam Tank.	*Tirumeshi Tank.*
1 report.	1 report.
1 estimate.	1 estimate.
1 plan of sluice.	1 hydraulic statement.
1 plan of weir.	1 statement of days on which water surplus over sill of head sluice.
	1 plan.

(1) *Kunnavakkam Tank.*

	RS.
Constructing two irrigation sluices and a surplus weir to—	2,780

(2) *Tirumeshi Tank.*

Excavating a new supply channel to—	2,530

ENCLOSURE.

REPORT to accompany estimate for repairing and improving the bund of Kunnavakkam tank, the terminal irrigation work of the group of the same name.

Amount of estimate—

	RS.
Original	2,780
Repairs	4,900

This is a first-class Government terminal work of the above-mentioned group depending for its supply from its own catchment area and the surpluses of the tanks above it and discharging its own surplus into a madugu which empties itself into the Pálár river.

Bund repairs are to be carried out in accordance with the sections accompanying. The surface of the old bund is first to be benched properly at intervals, especially at the toe of the bund, where the new earth meets the ground, to prevent any slipping of the same. Earth is to be brought to bund free from clods placed in layers of one foot and well consolidated by tamping each layer successively and finally brought to the required section.

Rough stone revetment.—The existing rough stone revetment from C.S. No. 3 to C.S. No. 13 requires repacking, for which provision has been made in this estimate. This being a moderately large tank, having 14 tanks above it, it is considered essential to revet the bund one foot above M.W.L. and accordingly provision has been made in the estimate, commencing from the top of the existing revetment. The stones of the existing revetment if found deficient when actually repacked it will be made good to the required measurements by picking up stones scattered plentifully in the bed of the tank.

Turfing.—This will be done with the best sods available in the neighbourhood and well watered and reared till the grass takes firm root into the ground. Both the slopes and the top will be turfed excluding the revetted portions.

Surplus arrangements.—There is a weir in this tank, 107 feet long, which is inadequate to discharge the tank's whole surplus and therefore it is proposed in this estimate to construct another weir, 137 feet long, at C.S. No. 19. The old weir also is in need of repair, for which provision is made in this estimate.

Irrigation sluices.—There are four sluices in this tank. The one at C.S. No. 2 was a pot sluice for irrigating about 50 acres of high lands. It was damaged; considering the safety of the bund it is proposed in this estimate to construct a cheap sluice in lieu of it. The head and cistern of the sluice at C.S. No. 3 is in ruins, but the tunnel, which is made of two granite stones placed one above the other with an opening cut in the middle 6 inches square and set in concrete, is in good condition having been repaired when the cyclone damages have been made up. As the dimension of the vent being only 6 inches square it is thought that an ordinary head of old pattern will do well and accordingly provision has been made. (For plan *vide* C.S. No 3.) The low-level sluice between C S. Nos. 9 and 10 was entirely washed away by the cyclone of the 31st October 1888 and it is proposed to construct one in lieu of it at C.S. No. 10. The high-level sluice at C.S. No. 15 is in good condition, but the head requires slight repairs, for which a lump sum is provided for in the estimate.

All works will be done in strict accordance with the rules in the standard specification.

Materials.—Rough stone from one mile distance; the track being bad As. 1–6 is allowed per cart per mile.

(Signed) T. MUTTUKUMARASWAMI MUDALI,
Overseer, Conjeeveram.

14th February 1891.

Although this is the terminal tank of the group nothing has been written about the condition of the upper tanks, for which either reports if on good condition in every particular or estimates if not so should have been sent in with this. The overseer has been written to regarding this.

(Signed) J. B. SANDERSON,
Sub-Divisional officer.

16th February 1891.

(Signed) C. H. B. BURLTON,
Ex. Engr., Chingleput division.

18th August 1891.

ORDER—dated 4th April 1892, No. 347 I., Public Works.

The following estimates are sanctioned:—

Irrigation.
43. Minor Works and Navigation.
Minor Works for which neither Capital nor Revenue Accounts are kept, P.W.D.
Original Works.

Kunnavakkam Tank—No. 297 of list of works in the Chingleput division appended to G.O., No. 407 I., dated 6th July 1887.

	RS.
1. Constructing two irrigation sluices and a surplus weir	2,780

Tirumeshi Tank—No. 250 of list of works in the Chingleput division appended to G.O., No. 407 I., dated 6th July 1887.

	RS.
2. Excavating a new supply channel	2,530

2. This sanction is registered as No. 2 I. of 1892–93.

(True Extract.)

(Signed) G. T. WALCH,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, V Circle, with thirteen enclosures.
,, Examiner, Public Works Accounts.
,, Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1892} Madras.

PUBLIC WORKS.

Dated April, 4th.

Recd. *Encl.*

G.O., 4th April 1892, No. 347 I.

APRIL.

Kunnavakkam and Tirumeshi Tanks

Estimates, amounting to Rs. 2,780 and 2,530, for certain works connected with the — in the Chingleput district, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following paper:—

From W. B. deWINTON, Esq., Superintendent of Works, No. I Periyár division, to the Chief Engineer, Public Works Department, dated Periyár, 30th March 1892, No. 290 C.E.

In forwarding, herewith, for sanction a revised estimate, amounting to Rs. 10,000, for steel jumpers already purchased for the project, I have the honour to state that the original estimate of Rs. 2,500 was sanctioned in May last from the sum placed at the disposal of Superintendent of Works to cover sanctions accorded by him to estimates under tools and plant, and to request that you will be so good as to sanction the balance of Rs. 7,500 from the sum at your disposal for the purpose.

Order—dated 7th April 1892, No. 357 I., Public Works.

The following revised estimate is sanctioned in supersession of the estimate of Rs. 2,500 sanctioned by the Superintendent of Works, the excess of Rs. 7,500 being met from the balance of the amount reserved for tools and plant required for the Periyár project, which will then be reduced to Rs. 6,960 :—

Major Works (Construction).
49. Irrigation.
Periyár Project.
III. Tools and Plant.
12. Miscellaneous.

	RS.
Purchasing steel jumpers, estimate	10,000

2. This sanction is registered as No. 3 I. of 1892-93.

(True Extract.)

(Signed) J. PENNYCUICK, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Chief Engineer for Irrigation.
,, Superintendent of Works, No. I Periyár division, with two enclosures.
,, Examiner, Public Works Accounts.
,, Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1892} Madras.

PUBLIC WORKS.

Dated April, 7th.

Recd. *Encl.*

G.O., 7th April 1892, No. 357 I.

APRIL.

Steel Jumpers

Revised estimate of Rs. 10,000 for purchasing — for use in No. I Periyár division, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following paper:—

No. 71 I.

Note by the Chief Engineer for Irrigation.

In G.O., No. 483 I., dated 9th June 1891, a revised estimate, amounting to Rs. 5,850, for constructing under-tunnel No. 7 of the Mahánadi canal, Rushikulya project, was approved involving an excess of Rs. 2,350 over the provision made for the work in the revised estimate for the project printed in Proceedings of the Madras Government, No. 482 I., dated 4th September 1890. It is suggested that this excess and the estimate of Rs. 3,660 approved in G.O., No. 551 I., dated 8th July 1891, for constructing an under-tunnel at $19\frac{1}{4}$ miles, Rushikulya canal, may be met from the balance available for unforeseen works of the Rushikulya project.

Chepák,
31st March 1892.

(Signed) G. T. WALCH,
Chief Engineer for Irrigation.

To the Joint Secretary to Government,
Public Works Department, Irrigation Branch.

Order—dated 7th April 1892, No. 358 I., Public Works.

The sanctions accorded in the two orders referred to in the foregoing note and aggregating Rs. 6,010 will be met from the balance available for unforeseen works of the Rushikulya project, which will then be reduced to Rs. 68,626.

2. This sanction is registered as No. 4 I. of 1892-93.

(True Extract.)

(Signed) G. T. WALCH,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, I Circle.
" Examiner, Public Works Accounts.
" Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1892} Madras.

PUBLIC WORKS.

Dated April, 7th.

Recd. *Encl.*

G.O., 7th April 1892, No. 358 I.

APRIL.

Rushikulya Project

Directing that the sanctions accorded to the estimates aggregating Rs. 6,010 to construct certain under-tunnels in the Mahánadi canal — be met from the balance available for unforeseen works of the project.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

From W. B. DEWINTON, Esq., Superintendent of Works, No. I Periyár division, to the Chief Engineer, Public Works Department, dated Periyár, 30th March 1892, No. 293 C.E.

I have the honour to submit, herewith, for sanction, a revised statement showing the redistribution of allotments for 1891–92 as requested in your No. 1499 C., dated 22nd March 1892, herewith returned with two enclosures.

ENCLOSURE.

STATEMENT showing the redistribution of allotments (Irrigation) for 1891–92.

Division.	Main head.	Sub head.	No. of item.	Names of works.	Amount of estimate.	Existing grant for 1891–92.	Modification of allotment applied for. Reduction.	Modification of allotment applied for. Increase.	Proposed grant.
				Capital Expenditure on Public Works not charged to Revenue.	RS.	RS.	RS.	RS.	RS.
				49. Irrigation.					
No. I Periyár division.	(1) Head works.	C. Works ..	1	Main dam	6,91,000	2,38,000	..	35,000	2,73,000
		Do. ..	2	Right bank escape ..	1,37,000	63,000	..	4,000	67,000
		Do. ..	3	Water-shed cutting ..	1,20,000	19,000	..	2,000	21,000
		Do. ..	4	Do. tunnel ..	2,61,000	72,000	1,000	..	71,000
		Do. ..	5	Putting a bund to the turbine channel reservoir	3,750	350	100	..	250
		K. Buildings ..	6	Buildings at Periyár and Thekady	1,78,740	16,250	..	750	17,000
		O. Miscellaneous.	7	Roads, locks and dams, &c. ..	87,000	17,050	..	1,950	19,000
		P. Maintenance.	8	Maintenance of works during construction	50,000	5,000	..	..	5,000
		III. Tools and plant.	9	Tools and plant	..	99,300	9,285	..	90,015
				Total ..	..	5,29,950	10,385	43,700	5,63,265
				Establishment charges at 23 per cent. on works ..	..	99,050	..	9,798	1,08,848
				Grand Total ..	..	6,29,000	10,385	53,498	6,72,113

ORDER—dated 8th April 1892, No. 359 I., Public Works.

The revised statement of redistribution, by component works, of the grant for the No. I Periyár division for 1891–92 is approved.

(True Extract.)

(Signed) J. PENNYCUICK, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Chief Engineer for Irrigation.
„ Superintendent of Works, No. I Periyár division.
„ Examiner, Public Works Accounts.
„ Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1892} Madras.

PUBLIC WORKS.

Dated April, 8th.

Recd. *Encl.*

G.O., 8th April 1892, No. 359 I.

APRIL.

Periyar Project

Revised statement of redistribution, by component works, of the grant for the No. I Periyár division for 1891–92, approved.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper:—

Office-note from the Examiner, Public Works Accounts, dated Madras, 25th March 1892, No. 454 S.A.

With reference to G.O., No. 237 I., dated 9th March 1892, I beg to point out that the excess of Rs. 906 was passed in G.O., No. 939 I., dated 9th December 1891, and that the present sanction is superfluous.

2. Please therefore have a correction statement issued.

ORDER—dated 8th April 1892, No. 360 I., Public Works.

Under the circumstances reported, the sum of Rs. 906 sanctioned in G.O., No. 237 I., dated 9th March 1892, is resumed and added to the balance of the amount reserved for unforeseen works of the Rushikulya project, which will then be raised to Rs. 69,532.

(True Extract.)

(Signed) G. T. WALCH,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, I Circle.
" Examiner, Public Works Accounts.
" Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1892} Madras.

PUBLIC WORKS.

Dated April, 8th.

Recd. *Encl.*

G.O., 8th April 1892, No. 360 I.

APRIL.

Rushikulya Project

Sanction accorded to the sum of Rs. 906 in G.O., No. 237 I., dated 9th March 1892, in connection with the No. 1 under-tunnel, Mahánadi canal, — being superfluous, resumed and added to the balance of the amount for unforeseen works of the project.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

From W. C. DEMORGAN, Esq., Executive Engineer, Rushikulya division, to the Superintending Engineer, I Circle, dated Russellkonda, 3rd March 1892, No. 2405.

I have the honour to forward, herewith, an estimate for channel from iron sluice No. 1, Rushikulya canal, amounting to Rs. 40, for sanction. The channel was completed in anticipation of sanction to meet requirements of last year's irrigation.

Endorsement by the Superintending Engineer, I Circle, dated 22nd March 1892, No. 1404 G.N.

Copy submitted to the Chief Engineer for Irrigation who is requested to be so good as to authorize the Examiner to pass the expenditure as the Executive Engineer states that the work has been completed in anticipation of sanction.

ORDER—dated 8th April 1892, No. 361 I., Public Works.

The Examiner of Public Works Accounts is authorized to pass the expenditure incurred without a sanctioned estimate on the work "Channel from iron sluice No. 1, Rushikulya canal."

(True Extract.)

(Signed) G. T. WALCH,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, I Circle.
" Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Govt. of {1892} Madras.

PUBLIC WORKS.

Dated April, 8th.

Recd. *Encl.*

G.O., 8th April 1892, No. 361 I.

APRIL.

Rushikulya Canal

Authorizing the Examiner, Public Works Accounts, to pass the expenditure incurred without a sanctioned estimate on the work of channel from iron sluice No. 1, —.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—the following papers :—

Proceedings of the Board of Revenue (Revenue Settlement, Land Records and Agriculture), dated 30th March 1892, Mis. No. 3148.

MR. CLOGSTOUN.

Read—the following letter from J. W. MARTIN, Esq., Superintending Engineer, III Circle, to the Chief Engineer for Irrigation, dated Bellary, 21st March 1892, No. 3750.

I have the honour to bring to your notice that I inspected on the 12th instant, in company with Mr. Johnston, Executive Engineer. Kurnool division, a site proposed by him for a new tank at Tokapalle village, Márkápur taluk, Kurnool district, north latitude 14° 55′, east longitude 79° 22′.

2. The site is situated on the Thigaleru (river), a very short distance to the north of Tokapalle, where the river passes through an opening in a low range of hills lying almost north and south. We measured the opening or gap with a 10-foot rod and found that it is 330 feet wide at bottom ; each side is composed of rock now out-cropping, but what is exposed is not very sound rock, being much broken and stratified. In fact the range of hills and the rocks of which they are composed are in appearance almost similar to the hills at Cumbum tank connected by means of the tank bank.

3. The drainage area of the Thigaleru above the opening in the hills is 283 square miles, and, judging from the atlas sheet, there appears to be only five existing tanks above the site proposed for the new tank. The Thigaleru rises high up on eastern slopes of the Nallamala range of hills, the hill portion of its drainage area being adjacent to the Jampalleru, one of the principal feeders of Cumbum tank. The Thigaleru falls into the Gundlakamma about 7 miles from the opening in the range of hills, and does not supply any irrigation works along this part of its course, and, as far as I can judge from the atlas sheet, the Gundlakamma itself does not supply any important irrigation works between where the Thigaleru falls in and the sea. Apparently therefore damming up the Thigaleru at the opening in the hills will not affect any important existing irrigation works.

4. In regard to the formation of the ground above or on the western side of the range of hills, it is open country moderately flat and appears to fall towards the hills with a gentle slope. Most of the land is under dry cultivation, except some wet cultivation under four small tanks. At present the whole drainage of the river must pass through the opening in the hills ; there is no other place for water to pass off,

but at the northern end of the range there is a low saddle marked A in the taluk map, herewith forwarded to be returned, which can be converted into an escape for surplus water. The soil at the saddle is shaly rock and can be easily removed for a width of 150 or 200 feet. The length of the weir of Cumbum tank is only 230 feet, consequently a weir between 150 and 200 feet long should be enough for the proposed tank. The water from this saddle will fall into an existing nalla near Budampulli and so pass on to the Thigaleru itself

5. With regard to the quantity of water likely to be available from the river, as the drainage area is similar in character to the drainage areas of the rivers supplying Cumbum tank, the rainfall in each case must be almost identical. Consequently if we accept the data afforded by Cumbum tank in calculating the quantity of water the Thigaleru will give, the result will be reliable. The drainage area of Cumbum tank is about 450 square miles, and the ayacut is 5,095 acres; the drainage area of the Thigaleru being 283 square miles, it should therefore supply sufficient water, if it can be stored, for 3,182 acres. Even during the last north-east monsoon it is said that three rather large floods came down the river.

6. Under these circumstances there is, I think, no doubt but that at least 3,000 acres can be irrigated, provided we can make a tank with sufficient capacity to store the water There are no levels available from which I can make an approximate estimate of the capacity of the proposed tank and a rough estimate of the cost of the work However the bed of the river at the site of the opening in the hills is about ten feet below the level of the adjacent ground, and I think we may assume that if a tank be made the bed will silt up at least five feet above the general existing level of the ground, or, in other words, the effective level of the bed of the tank will be 15 feet higher than the existing level of the river bed. The F.T.L may, I think, be at least 25 feet above the effective bed level or 40 feet above the existing bed of the river, and I think the margin between F.T.L. and M.W.L. may be 5 feet. I think with the F.T.L. 25 feet above the bed the waterspread will not be less than 2 square miles assuming the slope of the ground to be about 10 feet per mile. Taking mean depth as one-third of full depth, the capacity will be 440 millions cubic feet sufficient to irrigate with one crop about 2,000 acres, taking 1 cubic foot per second to irrigate 60 acres. As regards revenue the Tahsildar informed me that Rs 6 per acre would, he thought, be reasonable, so even 2,000 acres would give about Rs. 12,000 per annum, and I think we may take 2,000 acres as the minimum area that will be irrigated; but, as already stated, I believe there will be water for 3,000 acres if it can be stored. As to whether 3,000 acres of land are available there appears to be lots of land and of good quality too.

7. Regarding whether the opening in the hills should be closed with a masonry or an earthen dam. As already observed there is no way for water to pass off except through the opening in the hills, and it is not possible to provide any temporary way for passing off water during construction, except at great expense, for the saddle which it is proposed to convert into an escape is comparatively high and yet it is the only low one in the range of hills. In these circumstances a masonry dam will be more suitable than an earthen one, for, if necessary, water can be passed over it during construction. However if it should be decided to provide an earthen bank there will be no difficulty about soil, for the earth available is suitable. I recommend, however, that the dam should be made of concrete, for there is lots of stone as well as stone for lime available at site.

8. At present the bed of the river at site for dam is composed of sand for some depth, but there must be sound rock below, for there is sound rock at about 15 feet below the surface in a well recently dug in a field about 150 yards below the site.

9. Regarding the design and cost for a concrete dam, I think we will be safe if we allow for the depth of foundation below the existing bed level of river at site to be 15 feet, and, allowing for the dam to be 45 feet above the bed to suit the water levels given above, the total height will be 60 feet. Applying Molesworth's revised formula for high dams, and allowing eight tons per square foot as limit of pressure, the section for the dam will be about as per sketch. The present width of opening

in the hills is 330 feet, but the sides must be scarped down, and the side slopes will probably be at least 1 to 1, so, I think, the mean width may be taken as 450 feet Contents of dam will be as follows :—

	CUBIC FEET.
500 × 22·5 × 450	= 496,125
500 × 8·5 × 450	= 57,375
Total ..	553,500

The rate may be taken as Rs. 12 per 100 cubic feet, making the cost Rs. 66,120. The total cost of tank with a masonry dam will probably be about as follows :—

	RS.
Dam	67,000
Two sluices	2,000
Two channels	40,000
Diversion of road	8,000
One escape	2,000
Compensation for land	50,000
Sundries	5,000
Establishment and tools and plant at 23 per cent.	40,000
Total ...	2,14,000

Regarding compensation for land, it seems probable that the village of Rajampalli and two other small villages will be swamped. and this will, of course, affect the amount required for compensation, but on the other hand probably several ryots will consent to give up their land for nothing on condition that they get new land under the tank. In regard to a dam of earth, if the top width is made 30 feet, front slope 1½ to 1, rear slope 2 to 1 and the front slope only revetted, the cost will be about as follows, including two sluices :—

	Rs.
3,645,000 cubic feet earthwork at Rs. 10 per 1,000 cubic feet ...	36,450
Two sluices	4,500
Revetment	6,300
Gravel backing for revetment	1,575
Total ...	48,825

To this sum should be added something for protecting the work during construction and prevent it being washed away, and it would not be a simple matter to protect it, for, as already explained, it would be very difficult to arrange to pass of water, while at the same time it is almost certain that floods would have to be dealt with, for it would take about nine months to complete the bank about 3,000 coolies working daily. Under these circumstances, I think whether the dam is made of concrete or earth, the height being 60 feet, the project will cost not less than about two lakhs, and if we assume that only 2,000 acres will be irrigated, the return will be 6 per. cent on the outlay.

10. The present is a very favorable time for starting the work, for famine labour is abundant and a relief work of some size is much wanted in the neighbourhood of the site for the tank.

11. If it should be decided to provide a concrete dam, the coolies could be employed at once in collecting and breaking stone for concrete and for lime, and this work alone would give employment for three months to about 3,000 coolies.

12. In regard to the road from Dupad to Tokapalle and westwards, it must be diverted if the tank be made, but this can be easily done by carrying it round the northern end of the range of hills as shown in pencil. The road is not a very important one and is not bridged.

From G T WALCH, Esq., Chief Engineer for Irrigation, to the Secretary to the Commissioner of Revenue Settlement, Land Records and Agriculture (on famine duty), dated Madras, 28th March 1892, No. 171 M.

I have the honour to forward herewith letter No. 3750, dated 21st March 1892 (in original *to be returned*) from the Superintending Engineer, III Circle, and to request to be informed whether you consider it advisable, on the grounds of famine relief, that the collection and breaking of stone referred to in para. 11 of the Superintending Engineer's letter shall be authorized at once, even though there is a possibility that investigations may show that it is not advisable to construct the dam for which alone would the material be useful.

Resolution—dated 30th March 1892, Mis. No. 3148.

The Commissioner is of opinion that if there is a fair probability that the tank in question will be constructed, the famine labour which is now employed within a few miles in breaking and storing metal on a road which is very little used should be at once diverted to the work of breaking stone referred to in para. 11 of the Superintending Engineer's letter.

2. The laborers employed on the road referred to numbered, according to the return of the 19th instant, 3,962. They are employed at a cost to the State of about Rs. 12,000 per mensem. It will be necessary to afford employment to this number at least for a period of not less than three months—April, May and June—and though the continued employment after the end of May of this large number will not be necessary, a work which will employ any considerable number of people will be an immense boon to a taluk which has suffered severely from the loss of its crops during the last two monsoons.

(True Extract.)

(Signed) P. RAJARATNA MUDALIAR,
Secretary.

No. 74 I.

Note by the Chief Engineer for Irrigation.

The site seems favorable for formation of a large tank which would in ordinary years have water enough for from 2,000 to 3,000 acres of wet cultivation, but in years of drought would, like the not far distant Cumbum tank, fail almost entirely.

2. It is quite impossible, in the absence of levels and surveys, to deal with the work from an engineering point of view; but this much may be said with tolerable certainty: the dam, if ever made, should be of *masonry*, and, unless the stone to be obtained close of hand is exceptionally good for rubble, of concrete.

3. Whether under the circumstances the collection and preparation of stone for concrete should be proceeded with with a possibility that it may prove useless can only be determined on "famine" considerations.

CHEPÂK,
4th April 1892.

(Signed) G. T. WALCH,
Chief Engineer for Irrigation.

To the Joint Secretary to Government,
Public Works Department, Irrigation Branch.

ORDER—dated 9th April 1892, No. 364 I., Public Works.

The Superintending Engineer is authorized to at once proceed as a famine relief work with the collection and breaking of 20,000 cubic yards of stone for concrete at the site where the dam will have to be constructed if it be decided to carry out the suggested Tokapalli reservoir.

2. Care must of course be taken that the material is placed in the most convenient places for future use.

3. The project for construction of the reservoir will, with as little delay as possible, be thoroughly investigated.

(True Extract.)

(Signed) G. T. WALCH,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, III Circle, with one enclosure.
,, Examiner, Public Works Accounts.
,, Revenue Department.

IRRIGATION.

Govt. of {1892} Madras.

PUBLIC WORKS.

Dated April, 9th.

Recd. *Encl.*

G.O., 9th April 1892, No. 364 I.

APRIL.

Tokapalli Reservoir

Authorizing the Superintending Engineer to proceed at once as a famine relief work with the collection and breaking of 20,000 cubic yards of stone for concrete at the site where the dam will have to be constructed if it be decided to carry out the — in the Kurnool district.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—the following paper :—

From J. W. MARTIN, Esq., Superintending Engineer, III Circle, to the Chief Engineer for Irrigation, dated Bellary, 29th March 1892, No. A.

I have the honour to inform you that I have very recently received from the Executive Engineer, Bellary division, an estimate, amounting to Rs. 26,900, for improvements to Ramsagar channel, which is one of the Tungabhadra channels in the Bellary district. I approve generally of the items provided in the estimate, but it will take a little time to check the estimate in my office. I enclose a copy of the report, which will let you see what are the improvements proposed.

2. The Executive Engineer considers that the following works provided for in the estimate should be put in hand without delay when the channel will be closed.

	RS.
(1) Repairing anicut	2,000
(2) Strengthening and permanently closing breached weir at ¼ and stopping leaks through it	525
(3) Improving and providing screw gearing shutters to surplus sluice at ½	770
(4) Improving sectional area of channel	3,672
(5) Stopping leaks in the left bank of channel	2,000
(6) Stone revetment to inner left of channel	517

Only a lump sum is provided for repairing the anicut, for the water in the river has not fallen low enough to admit making a detailed estimate for improving it. The dry season is however of course the proper time to repair the anicut. Improving the sectional area of the channel merely consists of widening in places to the required width according to calculations ; there is practically no alteration proposed for the bed fall. So I think the work might be started in anticipation of sanction. Regarding stopping leaks in the left bank of the channel, it is reported that there is heavy leakage between the 2nd and 7th miles. This leakage should, I think, be stopped as soon as possible, and of course the dry weather is the proper time to carry out the work. Under these circumstances, I recommend that permission should be given to commence, in anticipation of formal sanction, the works the Executive Engineer proposes should be put in hand without delay.

3. As regards the other items of the estimate, there are practically only three, viz., Rs. 11,100 for reducing the existing 218 sluices to 82 suitable ones made with Doulton's glazed pipes, Rs. 4,075 for renewing seven bridges now in a dilapidated state and Rs. 1,102 for small works.

ORDER—dated 9th April 1892, No. 365 I., Public Works.

The permission to go on with certain works connected with the Ramsagar channel in anticipation of sanction to the estimate, recommended in para. 2 of the

Superintending Engineer's letter, No. A, dated 29th March 1892, is accorded on the understanding that there shall be no delay in submitting the work for sanction in the usual way.

(True Extract.)

(Signed) G. T. WALCH,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, III Circle.
" Examiner, Public Works Accounts.
" Revenue Department.

IRRIGATION.

Govt. of {1892} Madras.

PUBLIC WORKS.

Dated April, 9th.

Recd. *Encl.*

G.O., 9th April 1892, No. 365 I.

APRIL.

Ramsagar Channel, Bellary District

Granting permission to certain works connected with the — being put in hand in anticipation of sanction to the estimate on certain conditions.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers :—

From G. D. WYBROW, Esq., Superintending Engineer, I Circle, to the Chief Engineer for Irrigation, dated Gangupúr, 9th March 1892, No. 1387 G.N.

With reference to the note under para. 1303 of the Public Works Code, I have the honour to submit herewith a completion statement for the month of December 1891 received from the Executive Engineer, Rushikulya division, through the Examiner, Public Works Accounts, and to request that you will be so good as to obtain the sanction of Government to the excesses therein shown. You will observe from the statement that some of the works were executed without sanctioned estimates, and the Executive Engineer's letter, No 2115, dated the 29th January 1892, of which a copy is herewith enclosed, contains reasons as to why they were executed without sanctioned estimates.

2. The statement contains also some works on which there are savings which can be added to the balance of lump sum still available for unforeseen works connected with the project.

ENCLOSURES.

From W. C. DEMORGAN, Esq., Executive Engineer, to the Superintending Engineer, I Circle (through the Examiner, Public Works Accounts), dated Rushikulya, 29th January 1892, No. 2115.

In forwarding herewith a statement of completed works for December 1891, I have the honour to bring to your notice that the following works were executed without estimates sanctioned by competent authority under the circumstances explained against each work, and to request that you will be good enough to obtain the sanction of Government for the admission of charge by the Examiner.

2. *Repairs to buildings (a to f).*—On inspection of the buildings it was found necessary to make certain repairs such as re-thatching, &c., before the rains set in, and there was not sufficient time to frame estimates and to obtain sanction before the repairs were commenced. The necessary repairs were therefore carried out in anticipation of sanction.

3. *Byewash at 9⅝ miles, Rushikulya canal.*—Water was passed down the Rushikulya canal as far as 9⅝ miles, and a byewash to take surplus water was necessary. This was accordingly constructed. It should, in my opinion, be treated as a contingency of the Rushikulya canal earthwork estimate. A similar work will be required when the next reach is opened.

4. *Extension of Sagaram weir.*—There is tank at 12⅛ mile, Rushikulya canal, belonging to the Shergada Zemindar, which receives the drainage of ¾ square mile. The bund of the tank joins the left bank of Rushikulya canal. The existing weir was insufficient to discharge surplus in times of heavy flood, and there was risk of the tank breaching into the canal through the left

bank. The weir was lengthened by 17 feet with the permission of the Collector and the Zemindar at a cost of Rs. 287. This sum was debited to Project funds under (2) Main Canals and Branches—O. Miscellaneous Minor works.

Estimate. No.	Estimate. Date.	Name of work.	Amount of estimate.	Outlay (to nearest rupee).	Difference.
1	2	3	4	5	6
			RS.	RS.	RS.
		FAMINE RELIEF AND INSURANCE.			
		35. CONSTRUCTION OF P. I. WORKS, I. WORKS.			
		Rushikulya Project.			
		Rushikulya Section.			
..	..	Repairs to rest-house at Janamilli ..	..	137	(a) — 137
..	..	Repairs to Executive Engineer's quarters at Dogam	..	363	(b) — 363
..	..	Repairs to office establishment quarters at Dogam	..	776	(c) — 776
..	..	Repairs to the pandal around the division office at Dogam	..	24	(d) — 24
..	..	Repairs to rest-house at Madhavaborida ..	..	159	(e) — 159
..	..	Repairs to the road from division office to office establishment lines	30	26	4
		Rushikulya Canal.			
Return of sanctioned estimates for June 1891.		Out fall sluice under the flood bank near Janamilli store-shed	360	361	— 1
		Byewash at 9⅝ miles of Rushikulya canal ..	..	187	— 187
..	..	Extension of Sagaram weir	..	287	— 287
..	..	Repairs to rest-house at Errendra ..	..	38	(f) — 38
		(3). Distributaries, Rushikulya Canal.			
..	..	No. 1 Branch channel	..	32	— 32
Return of sanctioned estimates for November 1890.		,, 6 sluice, Rushikulya canal	420	441	— 21
		,, 5 do. do.	420	439	— 19
..	..	Iron sluice in place of No. 2 sluice ..	..	156	— 156
G.O., No. 756 I.	1st Oct. 1891.	Piping over No. 6 and 7 undertunnel ..	270	279	— 9
		Culvert to take road over channel from 8½ mile, Rushikulya canal	270	276	— 6
Return of sanctioned estimate for March 1891.		Mile coolies on Mahánadi canal for 1890–91.	288	278	10
G.O., No. 756 I.	1st Oct. 1891.	Drop No. 2 on channel from 8½ miles, Rushikulya canal	220	217	3
Do. ..	Do. ..	Do. No. 3 do. do. ..	220	197	23
Do. ..	Do. ..	Do. ,, 4 do. do. ..	160	159	1

No. 10.

Forwarded to the Examiner, Public Works Accounts, Madras and Coorg, for verification and transmission to the Superintending Engineer, I Circle.

(Signed) W. C. DEMORGAN,
Executive Engineer, Rushikulya Division.

29th January 1892.

Office-note to the Examiner, Public Works Accounts, dated 23rd March 1892, No. 93.
,, from the ,, ,, ,, ,, 31st ,, ,, ,, 476.

No. 76 I.

Submitted to Government.

2. The completion statement shows that an expenditure of Rs. 2,159 was incurred without sanctioned estimates. After deducting the savings effected on sanctioned works shown in the statement, the net excess requiring sanction amounts to Rs. 2,174.

3. There does not appear to be adequate reason for not having prepared estimates for repairs to the various buildings dealt with in time to have admitted of sanction before the commencement of work.

CHEPÂK,
6th April 1892.

(Signed) W. C. LEWIS,
for Chief Engineer for Irrigation.

To the Joint Secretary to Government,
Public Works Department, Irrigation Branch.

ORDER—dated 12th April 1892, No. 370 I., Public Works.

The Examiner of Public Works Accounts is authorized to pass the expenditure incurred on the works entered in the statement referred to, the net excess of Rs. 2,174 being met from the balance of the amount reserved for unforeseen works of the Rushikulya project, which will then be reduced to Rs. 67,358.

2. This sanction is registered as No. 5 I. of 1892–93.

(True Extract.)

(Signed) G. T. WALCH,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, I Circle.
" Examiner, Public Works Accounts.
" Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1892} Madras.
PUBLIC WORKS.

Dated April, 12th.

Recd. *Encl.*

G.O., 12th April 1892, No. 370 I.

APRIL.

Rushikulya Project

Authorizing the Examiner, Public Works Accounts, to pass the expenditure incurred on works entered in the completion statement for the months of December 1891 of the Rushikulya division, the net excess of Rs. 2,174 being met from the balance of the amount for unforeseen works of the —.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers :—

From Lieut.-Colonel R. R. E. DRAKE-BROCKMAN, R.E., Superintending Engineer, IV Circle, to the Chief Engineer for Irrigation, dated 26th February 1892, No. 62-E.I.

I have the honour to forward herewith for approval, sanction and allotment of funds plan and estimate for fixing screw gearing shutters in the scouring vents of the Pálár anicut in lieu of the present arrangement of needle shutters.

2. When at the anicut on the occasion of the flood of the 23rd October last, I noticed the extreme difficulty experienced in removing these needles, and out of the 42 vents only two were fully opened before the water rose on the anicut too high for the lascars to remain on it any longer in safety.

3. In order to avoid any superstructure, it was found necessary to close the upper portion of the vents and leave the lower half open for scouring purposes. It is calculated that when these shutters are placed in position the whole can be opened by the staff of lascars at the anicut in less than an hour, working from both ends.

No. 75 I.

Submitted to Government. The Superintending Engineer classified the estimate under "Revenue Extensions and Improvements," but, in accordance with clause (*c*), para. 1 of the circular embodied in Proceedings of Madras Government, No. 88 I., dated 3rd February 1892, the proposed outlay should be sanctioned under "Capital Account," as the working expenses of the Pálár anicut system at present exceed 36 per cent. of the revenue derived from it.

CHEPÂK,
5th April 1892.

(Signed) W. C. LEWIS,
for Chief Engineer for Irrigation.

To the Joint Secretary to Government,
Public Works Department, Irrigation Branch.

ORDER—dated 12th April 1892, No. 371 I., Public Works.

The following estimate is sanctioned, the amount required to cover the proposed outlay being met by increasing the total existing* sanction for direct charges for the Pálár anicut system from Rupees 19,09,350 to Rs. 19,21,250 under para. 186, chapter XV, volume II, of the Government of India Code :—

* G.O., No. 83 I., dated 30th January 1891.

Irrigation.
43. Minor Works and Navigation.
Minor Works for which Capital and Revenue Accounts are kept.
Pálár Anicut System.
Capital Account.
I. Works.
(1) Head Works.
C. Works.

Fixing screw gearing shutters in the scouring vents of the Pálár anicut—

	RS.
Works	9,660
Establishment	2,222
Tools and Plant	18
Total ...	11,900

2. This sanction is registered as No. 6 I. of 1892–93.

3. To provide the amount required for expenditure on this work during the current year, the Superintending Engineer will suggest a transfer from the allotments proposed in the preliminary budget estimates of the year for other works in the divisions in his circle.

4. Ordered that a copy of these Proceedings be forwarded to the Government of India for information.

(Here enter No. 372 I., Public Works, dated 12th April 1892.)

(True Extract.)

(Signed) G. T. WALCH,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, IV Circle, with three enclosures.
„ Examiner, Public Works Accounts.
„ Revenue Department.

ENDORSEMENT—dated 12th April 1892, No. 372 I., Public Works.

Forwarded.

(By Order.)

(Signed) G. T. WALCH,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

IRRIGATION.
ACCOUNT.

Govt. of {1892} Madras.

PUBLIC WORKS.

Dated April, 12th.

Recd. *Encl.*

G.O., 12th April 1892, Nos. 371, 372 I.

APRIL.

Palar Anicut

Forwarding to the Government of India copy of Proceedings sanctioning the estimate of Rs. 11,900 for fixing screw gearing shutters in the scouring vents of the —.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following paper:—

From J. HANNAN, Esq., Superintending Engineer, II Circle, to the Chief Engineer for Irrigation, dated Bezváda, 26th March 1892, No. 520 B.C.

With reference to your memorandum No. II/37 K.S. of 27th February 1892, I have the honour to forward, herewith, for your approval and sanction of Government, a deviation statement for improvements to store and office at Kottapatam.

Order—dated 12th April 1892, No. 373 I., Public Works.

The deviation statement for the work "improvements to store and office at Kottapatam" is approved, the excess of Rs. 30 over the original estimate of Rs. 1,090 being met from the balance of the amount reserved for unforeseen works of the Buckingham canal, which will then be reduced to Rs. 1,58,440.

2. This sanction is registered as No. 7 I. of 1892–93.

(True Extract.)

(Signed) G. T. WALCH,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, II Circle, with five enclosures.
" Examiner, Public Works Accounts.
" Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1892} Madras.

PUBLIC WORKS.

Dated April, 12th

Recd. *Encl.*

G.O., 12th April 1892, No. 373 I.

APRIL.

Store and Office at Kottapatam

The deviation statement for the work of improvements to —, Buckingham Canal division, approved.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—the following paper :—

From the Under-Secretary to the Government of India, Public Works Department (Civil Works—Irrigation), dated Calcutta, 28th March 1892, No. 68 I.

The undermentioned papers are forwarded to the Secretary to the Government of Madras, Public Works Department, for information, with reference to correspondence ending with his No. 777 I., dated the 7th October 1891.

ENCLOSURES.

DESPATCH from the Right Honorable Her Majesty's Secretary of State for India, to His Excellency the Most Honorable the Governor-General of India in Council, dated India Office, London, 3rd March 1892, No. 10, Public Works.

Financial results of the Godávari delta system of Irrigation and Navigation.

I have received your Excellency's Public Works letter, No. 2, of the 13th January 1892, reporting on the financial result of the Godávari delta system of Irrigation and Navigation works in the Madras Presidency, on the closing of the Capital Account on the 31st March 1890.

2. I observe that on the above date the total outlay, both direct and indirect, amounted to Rs. 1,27,19,245, or Rs. 3,04,951 less than the revised estimate, and that you had sanctioned a further expenditure of Rs. 99,218 to complete the system.

3. The annual surplus revenue after paying all charges, including interest on the capital outlay of Rs. 1,27,19,245, amounts to Rs. 11,86,318, which is equivalent to a return of 9·33 per cent.

4. These results are highly satisfactory, and I cordially agree with you in considering that they reflect great credit on the officers who have been concerned in the inception and execution of this great system of irrigation.

DESPATCH from the Government of India, Public Works Department (Civil Works—Irrigation), to the Right Honorable Her Majesty's Secretary of State for India, dated Calcutta, 13th January 1892, No. 2, Public Works.

We have the honour to report that, in accordance with the rules contained in para. 155 of Public Works Department Code, volume II, chapter XV, section V, as modified by Standing Order No. 191 of 20th February 1890, the construction estimate of the Godávari Delta System of Irrigation and Navigation Works in the Madras Presidency has been closed with effect from the 31st March 1890, any subsequent outlay debitable to the Capital Account of the system being regulated by the rules in para. 156 of the same chapter of the code.

2. The complete revised estimate for the Godávari system, amounting to Rs. 1,30,32,653,* was sanctioned in Lord Hartington's despatch No 42 P.W., dated 17th August 1882. This sanction expired in August 1887, but was extended by us to the end of the financial year

	RS.
* Direct charges	1,10,88,695
Indirect do.	19,43,958

1889-90. In August 1888 a redistribution of the sanctioned amount was authorised by the Government of India, which resulted in a reduction of Rs. 8,457 as shown in the margin, and the amount of the sanctioned estimate for the project now stands at Rs. 1,30,24,196.

	Secretary of State's sanction.	Redistribution sanctioned by the Govt. of India.
	RS.	RS.
Direct charges ..	1,10,88,695	1,10,89,332
Indirect do. ..	19,43,958	19,34,864
	1,30,32,653	1,30,24,196
Difference (reduction)..	8,457	

3. We invite your Lordship's attention to the attached report by the Chief Engineer for Irrigation, Madras, No. 60 I., dated 25th March 1891, which contains a brief history of the Godávari Delta System of Irrigation and Navigation Works.

4. The total outlay, both direct and indirect, to end of 1889-90 stands at Rupees 1,27,19,245 as exhibited in the statement attached to the Madras Government Proceedings of the 7th October 1891, or Rs. 3,04,951 less than that of the revised sanction. Against this saving schedules of works which remained to be executed to complete the system after the closure of the construction estimate have been sanctioned by us, under the rules referred to in para. 1 of this despatch, to a total amount of Rs. 99,218.

5. The yearly revenue receipts from the system, as shown in columns 11 and 12 of statement A furnished by the local Government, are better than the forecast submitted with the completion estimates; but the maintenance charges were under-estimated as explained in paras. 13 and 14 of the Chief Engineer's note, dated 25th March 1891. The net result is, however, a very close approximation to the figures given in the forecast. We may add that the share of enhanced land revenue credited to the system is likely to be increased considerably at the next settlement.

6. The results achieved are extraordinarily good, and we consider that they reflect great credit on the officers who have been concerned in the inception and execution of this great system of irrigation. The annual surplus revenue after paying all charges, including interest on the capital outlay of Rs. 1,27,19,245, amounts to Rs. 11,86,318, which is equivalent to a return of 9·33 per cent. If interest charges be not included, the annual surplus amounts to Rs. 16,18,194, or 12·72 per cent. on the capital expenditure.

7. These are the immediate financial results. The indirect benefits following on the creation of this large irrigated area cannot be similarly estimated in figures, but they are none the less substantial and enduring.

ORDER—dated 12th April 1892, No. 374 I., Public Works.

Recorded.

(True Extract.)

(Signed) G. T. WALCH,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, I Circle.
„ Examiner, Public Works Accounts.
„ Revenue Department.

IRRIGATION.

Govt. of {1892} Madras.

PUBLIC WORKS.

Dated April, 12th.

Recd. *Encl.*

G.O., 12th April 1892, No. 374 I.

APRIL.

Godavari Delta System

Endorsement from the Government of India forwarding copy of despatches of the Secretary of State and of that Government regarding the financial results of the — of Irrigation and Navigation, recorded.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

From G. D. WYBROW, Esq., Superintending Engineer, I Circle, to the Chief Engineer for Irrigation, dated Dowlaishweram, 27th March 1892, No. 1409 G.N.

I have the honour to submit, herewith, an estimate of Rs. 70 for repairs to the store shed at Suradá connected with the Rushikulya project and to request that you will be so good as to obtain sanction to the same.

ORDER—dated 13th April 1892, No. 376 I., Public Works.

The following estimate is sanctioned from the balance of the lump sum provision of Rs. 13,000 made for maintenance during construction in the revised estimate for the Rushikulya project printed in Proceedings of the Madras Government, No. 482 I., dated 4th September 1890 :—

Famine Relief and Insurance.
35. Protective Irrigation Works.
Rushikulya Project.
I. Works.
(1) Head Works.
P. Maintenance.

	RS.
Repairs to store shed at Suradá, estimate	70

2. This sanction is registered as No. 8 I. of 1892–93.

(True Extract.)

(Signed) G. T. WALCH,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, I Circle, with one enclosure.
" Examiner, Public Works Accounts.
" Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1892} Madras.

PUBLIC WORKS.

Dated April, 13th.

Recd. *Encl.*

G.O., 13th April 1892, No. 376 I.

APRIL.

Store Shed at Surada

Estimate of Rs. 70 for repairs to — in the Rushikulya division, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

Read—the following paper :—

From General Sir H. N. D. PRENDERGAST, K.C.B., R.E., Officiating Resident in Mysore, to the Chief Secretary to Government, dated Bangalore, 21st March 1892, No. 929/81–8.

I have the honour to refer you to this office letter No. 1967/818, dated the 14th June 1889, on the subject of a project for the construction of a tank in the Chintamani taluk of the Kolar district across the Kushanati river.

2. The site of the proposed tank is in a place where a large work may be wanted before long to afford employment to people, as the crops in the locality have somewhat extensively failed this year and the other works in the neighbourhood are fast approaching completion. In fact, it is on the ground chiefly of the work being perhaps shortly required for famine relief that this reference is now made at the instance of the Durbar.

3. The Mysore Government request that His Excellency the Governor in Council will accord his consent to the proposed work under Rule II of the Irrigation Controversy Rules which were forwarded for the acceptance of the Madras Government under cover of this office letter No. 144/346–90 of the 15th January 1892.

4. The favour of an early reply is requested.

No. 516, Political.

Transferred to the Public Works Department in continuation of endorsement No. 112, dated 21st January 1892.

(Signed) J. F. PRICE,
Chief Secretary.

22nd March 1892.

No. 73 I.

Note by the Chief Engineer for Irrigation.

The proposed work lies on the "Kotagal branch of the Pápaghni" No. 34 of schedule B of the "Rules" lately agreed to by the Governments of Madras and Mysore; it would prejudicially affect the supply to the Kondakur-Veyasa-samudram tank, No. 49, Imperial list, ayacut 1,396 acres, and to the channels from the Pápaghni, Nos. 54 and 60 of the Imperial list, ayacut 1,819 acres.

2. The permission asked should not, it is thought, be given, because the utmost limit to which interference with the supply of the works above named can be allowed has been reached in agreeing to the construction of three works entered in schedule C on the "Pápaghni main stream."

CHEPÂK,
4th April 1892.

(Signed) G. T. WALCH,
Chief Engineer for Irrigation.

To the Joint Secretary to Government,
Public Works Department, Irrigation Branch.

ORDER—dated 13th April 1892, No. 377 I., Public Works.

Ordered that the following letter be sent.

(True Extract.)

(Signed) G. T. WALCH,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Political Department, with draft letter.

IRRIGATION.

Govt. of {1892} Madras.

PUBLIC WORKS.

Dated April, 13th.

Recd. *Encl.*

G.O., 13th April 1892, No. 377 I.

APRIL.

Tank

Ordered that the Resident in Mysore be informed that this Government is unable to agree to the construction of a — in the Chintamani taluk of the Kolar district across the Kushanati river.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—the following paper :—

From C. VINCENT, Esq., Under-Secretary to the Government of India, Public Works Department (Civil Works—Irrigation), to the Secretary to the Government of Madras, Public Works Department, dated Calcutta, 8th March 1892, No. 52 I.

In para. 17 of the review by the Government of India of the Administration Report of Irrigation Works in the Madras Presidency for the year 1890–91, No. 13 I., dated the 22nd January 1892, it was stated that a separate communication will be addressed to the Madras Government regarding certain discrepancies noticed in some of the figures.

2. I am now directed to point out that the assessed revenue on the Kurnool canal, as given in statement IV C, amounts to Rs. 81,789, whereas in the individual canal report on page 29 it is entered as amounting to Rs. 85,238. I am to request that this discrepancy may be explained.

3. The difference between the figures representing the Irrigation revenue on the Kurnool canal in column 3 of statement No. II on page 7 of the report and those in column 2 of statement I C. is due, it is presumed, to the former being for the fasli year and the latter for the official year.

4. The difference between the figures representing direct charges for maintenance in column 24 of statement I C. and those giving the net expenditure of the year in column 15 of statement No. I on page 3 is due apparently to the inclusion in the latter of the charge for Public Works Department revenue establishment (columns 13 and 14 of statement I C.,) less the direct old maintenance charges (column 27 of I C.). It would be as well, I am to say, if this were explained in a foot-note to statement No. I. on page 3, as otherwise the difference between the two sets of figures may occasion confusion.

5. In the figures relating to minor works for which neither Capital nor Revenue accounts are kept in statement No. II on page 7 of the report, the outlay on tank restoration works is entered separately, but in the statement on page 81 this outlay is included in the figures giving the expenditure in each district on "other minor Works, Public Works Department." That these latter figures include expenditure on tank maintenance might also, I am to say, be explained in a foot-note.

Office-note to the Examiner, Public Works Accounts, dated 16th March 1892, No. 89.
,, from the ,, ,, ,, ,, 2nd April ,, ,, 490 S.A.

ORDER—dated 13th April 1892, No. 378 I., Public Works.

Communicated to the Chief Engineer for Irrigation and the Examiner of Public Works Accounts, who will see that the foot-notes suggested in paras. 4 and 5 of the Government of India letter are, in future, added to the statements referred to.

2. The following letter will be sent to the Government of India.

(Here enter No. 379 I., Public Works, dated 13th April 1892.)

(True Extract.)

(Signed) G. T. WALCH,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Examiner, Public Works Accounts.

IRRIGATION.

Govt. of {1892} Madras.

PUBLIC WORKS.

Dated April, 13th.

Recd. *Encl.*

G.O., 13th April 1892, No. 378 I.

APRIL.

Administration Report of Irrigation Works

Letter from the Government of India pointing out certain discrepancies in figures in the — in Madras for 1890–91, communicated to the Chief Engineer for Irrigation and the Examiner, Public Works Accounts.

PUBLIC WORKS DEPARTMENT.

Irrigation.

LETTER—from

G. T. WALCH, ESQ.,

Joint Secretary to the Government of Madras,
Public Works Department,
Irrigation Branch,

To

THE SECRETARY TO THE GOVERNMENT OF INDIA,
PUBLIC WORKS DEPARTMENT.

SIR,

In reply to your Under-Secretary's letter, No. 52 I., dated 8th March 1892, I am directed to state that the discrepancies alluded to in paras. 2 and 3 are due to an oversight in the office of the Examiner of Public Works Accounts in preparing the statements IV-C and I-C and care will be taken to avoid a recurrence of the error.

2. I am further to state that the foot-notes suggested in paras. 4 and 5 of the letter will, in future, be added to the statements referred to.

I have the honour to be,
Sir,
Your most obedient servant,

(Signed) G. T. WALCH,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

FORT ST. GEORGE,
13th April 1892.

IRRIGATION.

Govt. of {1892} Madras.

PUBLIC WORKS.

Dated April, 13th.

Recd. *Encl.*

13th April 1892, No. 379 I.

APRIL.

Administration Report of Irrigation Works

Explaining the discrepancies noticed in some of the figures in the — in Madras for 1890-91.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper:—

From W. B. DEWINTON, Esq., Superintendent of Works, No. I Periyár division, to the Chief Engineer, Public Works Department, dated Periyár, 6th April 1892, No. 9 C.E.

I have the honour to submit, for sanction, an estimate of Rs. 2,835 * for the maintenance of branch road from Kumili to Periyár rice bazaar for 1892–93.

* Altered in the office of the Chief Engineer, P.W.D., to Rs. 2,830.

ENCLOSURE.

REPORT to accompany estimate for maintenance of Thekady-Periyár road in 1892–93.

During 1891–92 the road, which previously had the thinnest possible coat of metal on mud, has received an extra coat of metal for a considerable part of its length. Nearly all the larger bridges have also been completely renewed. The rate allowed per mile for 1892–93 is therefore considerably lower than the actual cost of maintenance per mile has been during 1891–92.

29th March 1892.

(Signed) S. D. PEARS,
Executive Engineer, Transport and Stores.

ORDER—dated 13th April 1892, No. 383 I., Public Works.

The following estimate is sanctioned from the balance of the amount reserved for unforeseen works of the Periyár project, which will then be reduced to Rupees 2,23,414:—

Major Works (Construction).
49. Irrigation.
Periyár Project.
I. Works.
(1) Head Works.
P. Maintenance.

	RS.
Maintenance of branch road from Kumili to Periyár rice bazaar for 1892–93, estimate	2,830

2. This sanction is registered as No. 9 I. of 1892–93.

(True Extract.)

(Signed) J. PENNYCUICK, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Chief Engineer for Irrigation.
" Superintendent of Works, No. I Periyár division, with one enclosure.
" Examiner, Public Works Accounts.
" Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1892} Madras.

PUBLIC WORKS.

Dated April, 13th.

Recd. *Encl.*

G.O., 13th April 1892, No. 383 I.

APRIL.

Road

Estimate of Rs. 2,830 for the maintenance of branch — from Kumili to Periyár rice bazaar for 1892–93, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

From W. JOPP, Esq., Executive Engineer, Kistna Eastern division, to the Superintending Engineer, II Circle, dated 30th March 1892, No. 6502.

In forwarding, herewith, the following extract from the audit note on the accounts of this office for November 1891, I have the honour to request that you will be good enough to get G.O., No. 899 I., dated 23rd November 1891, corrected to include the Rs. 30 in question under Major :—

Item No.	Description of items.	As shown by Executive Engineer.	As corrected by Examiner.	Remarks by Examiner.	Replies by Accountant.	How disposed of.
		RS.	RS.			
20	Original Works, Major.	4,622	4,592	*Vide* G.O., No. 899 I., dated 23rd November 1891; please correct and report.	The difference of Rs. 30 in the allotment sanctioned for completing river charts which is debitable to the estimate "Surveying, Kistna river," Rs. 12,000, a major original work, so the amount was included under Major instead of Minor as was classed erroneously in the Government Order referred to.	Please get the Government Order corrected accordingly; carried to M. O. I. L. for January 1892.
	Original Works, Minor.	500	530			

No. 20 K.S.

Forwarded to the Chief Engineer for Irrigation for favour of compliance.

(Signed) J. HANNAN,
Superintending Engineer, II Circle.

2nd April 1892.

ORDER—dated 13th April 1892, No. 384 I., Public Works.

The allotment of Rs. 30 for the work referred to will be considered as having been sanctioned under Major Original Works.

(True Extract.)

(Signed) G. T. WALCH,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, II Circle.
" Examiner, Public Works Accounts.
" Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1892} Madras.

PUBLIC WORKS.

Dated April, 13th.

Recd. *Encl.*

G.O., 13th April 1892, No. 384 I.

APRIL.

Funds

Stating that the difference of Rs. 30 in the allotment sanctioned for completing river charts debitable to the estimate, "Surveying Kistna river," will be considered as having been sanctioned under Major Original Works.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

From J. W. MARTIN, Esq., Superintending Engineer, III Circle, to the Chief Engineer for Irrigation, dated Guntakal, 18th March 1892, No. 3737.

With reference to your memo. No. III-C.K.R., dated 2nd March 1891, in the matter of Sekrail Cuthwa across Gundlakamma river, I have the honour to submit two plans and two estimates, amounting to Rs. 9,560 and Rs. 8,270, respectively, for constructing a set of scouring sluices. The estimate, amounting to Rs. 9,560, provides for a road 12 feet wide, while the other estimate provides for a roadway of only 5 feet wide.

2. Formerly, that is, before the bank of the Sekrail Cuthwa was breached, the main road from Cumbum to Kurnool passed over it and so crossed the Gundlakamma river, but, after the bank was breached, the District Board constructed a strong road dam across the river and at present the road crosses the river by means of the dam. I understand, however, that, on occasions, when much water flows down the river, the dam suffers a good deal and that it costs a comparatively large sum to repair it, so, if a set of sluices be built, the Board might wish the road to be carried over the bank of the Sekrail Cuthwa as formerly paying Rs. 1,070 the extra expense. Consequently I am sending two plans, one providing for a road of 12 feet wide and the other for a roadway 5 feet wide. I have not, however, asked the Board whether it will pay the extra cost for providing a roadway 12 feet wide, for, I think, it is better to defer the question until it is finally decided whether a set of sluices will be constructed at all.

3. There has been much correspondence about the Sekrail Cuthwa question, but it will, I think, suffice if I describe briefly the history of the case. For many years a bank, called the "Sekrail Cuthwa," was maintained across the Gundlakamma * river close to the town of Cumbum and the water held back was utilized for irrigating land adjacent to the town. In comparatively recent years Cumbum was said to be very unhealthy in comparison with former times, malarious fever being more or less always present. The sanitary authorities attributed the unhealthiness of the town to the "Sekrail Cuthwa" bank holding back the water of the Gundlakamma river and thus interfering with the proper drainage of the Cumbum town itself and the wet cultivation adjacent to it, also that, as the water for some distance above the bank was practically stagnant, it was polluted with decaying vegetable matter and filth of all kinds. In consequence of this a committee to investigate into the state of affairs and propose remediable measures was appointed. What was proposed is described in the memorandum by Major Hasted, embodied with G.O., dated 25th October 1876, No. 2846 Amongst other measures the committee proposed to provide in the Sekrail Cuthwa bank a set of sluices on rather a low level which could be opened

* Surplus from the "Cumbum tank." G.T.W.

occasionally in view to scouring out and thus passing off all the objectionable matters about which complaints had been made, but for some reason the set of sluices has not been built to date. However, shortly after the committee sent in its report, Government appears to have approved of breaching the bank itself and accordingly it was breached. Subsequently the ryots interested in the land irrigated from the Sekrail Cuthwa represented that, owing to the breach in the bank, they could not irrigate their land, and, in a report * from the Deputy Collector No. 345, dated 29th October 1883, it was brought to notice that the loss of revenue, owing to the ryots not being able to irrigate fully their land, was Rs. 2,000 annually, and, apparently, in view to stopping such a large loss of revenue, the ryots were allowed three or four years ago to construct a little above the old site a strong bank with revetment on both sides across the river at their own expense and thus practically restore the old state of things and they are keeping up the bank down to the present time.

* A copy is forwarded.
J.W.M.

4. Now the question to be settled is whether the Sekrail Cuthwa should be restored as a final arrangement. If a bank across the river be approved, I think a set of sluices should be constructed, for, otherwise, the bank will be breached when there is much water in the river. The existing bank is, as already noticed, some distance above the site of the old one, and, in case it should be breached, it will cost a considerable sum to restore it, for earth cannot be easily obtained except by taking up valuable land and besides the river is rather deep with reference to the level of the adjacent ground, so, if for no other reason than to save money as regards the cost of restoring the bank from time to time, and, perhaps, loss of revenue resulting by the bank being breached, I think the set of sluices should be provided if Government decide finally that the Sekrail Cuthwa should be restored.

5. The estimate provides for building the set of sluices in the line of the old bank and for restoring that bank.

6. The present is a favorable time for carrying out the work, for there is a great deal of famine labour available at Cumbum. Of course skilled labour would have to be employed for actual building work, but the collection, and, to a great extent, the preparation of materials, might be carried out with famine labour.

No. 77 I.

Submitted to Government. The design for the work with a road 12′ wide has been modified and the roadway reduced to 9′ which is ample width for one bandy, whilst the 12′ proposed is not wide enough for two bandies to pass one another. The estimate which amounts to Rs. 9,500 is recommended for sanction.

CHEPÂK,
8th April 1892.

(Signed) G. T. WALCH,
Chief Engineer for Irrigation.

To the Joint Secretary to Government,
Public Works Department, Irrigation Branch.

ORDER—dated 14th April 1892, No. 385 I., Public Works.

The following estimate is sanctioned :—

Irrigation.
43. Minor Works and Navigation.
Minor Works for which Capital and Revenue Accounts are kept.
Cumbum Tank System.
Capital Account.
(3) Distributaries.
Sekrail Cuthwa Channel.
C. Works.

Constructing a scouring sluice and bridge across the Cumbum tank surplus below head of Sekrail Cuthwa channel—

	RS.
Work	9,500
Establishment	2,185
Tools and plant	15
	11,700

2. This sanction is registered as No. 10 I. of 1892–93.

(True Extract.)

(Signed) G. T. WALCH,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, III Circle,
with twelve enclosures.
„ Examiner, Public Works Accounts.
„ Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1892} Madras.

PUBLIC WORKS.

Dated April, 14th.

Recd. *Encl.*

G.O., 14th April 1892, No. 385 I.

APRIL.

Cumbum Tank

Estimate of Rs. 11,700 for constructing a scouring sluice and bridge across the — surplus below head of Sekrail Cuthwa channel, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—the following papers :—

No. 15 C.E.

Progress Report for March 1892.

General.—Another favorable month for work and the outturn on main dam nearly equalled the "record" of February and would have surpassed it but that, owing to the usual prevalence of fever at this period of the year, the labour began to disappear. Two accidents on the tramway incline from right bank escape to workshops, of which one caused the death of a fitter, also interfered with the rapid and regular supply of stone. They were due to the breaking of one of the couplings of the trucks and of the wire rope, respectively. Precautions have been taken to prevent a recurrence of such accidents. Mr. VanIngen, Photographer from Trivandrum, took photographs of the works during the month.

2. *Rainfall.*—The month has been exceptionally dry and the river never lower; rainfall at Periyár 0·43", at Thekady 0·65".

3. *Sanitation.*—March is always an unhealthy month on these hills and has not been more than usually so this year. Health statistics are as follow :—

Camp.	Population.	Total treated.	Deaths.	Daily average sick.	Ratio per 1,000 of	
					Sick.	Deaths.
Periyár	1,536	532	5	35·95	346·35	3·24
Thekady..	750	336	3	18·87	448·00	4·00

Of the deaths 2 were due to accidents and 3 to bronchitis.

4. *Main dam.*—The outturn for the month has been—

	C. FT.
Concrete	81,099
Rubble	62,859
Total ...	143,958

as compared with 148,097 in February. The front wall on right flank was raised to + 37; the diagonal wall on right, built to isolate the work in progress from floods, was built to + 33; the rear face on right was raised to + 23; and the concrete in front of it to an average of + 13. Three new piers were built to + 30 in line of front wall

on right in continuation of vents to turbine channel. The following table shows the progress of the working season of 1891–92 month by month :—

Months.	Concrete in mortar.	Rough stone in mortar.	Total
1891.			
June	..	3,348	3,348
July	29,466	12,364	41,830
August	52,883	16,049	68,632
September	35,620	26,934	62,554
October	38,733	11,963	50,696
November	29,586	34,779	64,365
December	97,858	26,072	123,930
1892.			
January	87,078	23,965	111,043
February	92,427	55,670	148,097
March	81,099	62,859	143,958
Total ..	544,750	274,003	818,753

5. *Right bank escape.*—Outturn—

	C. FT.
Stone	83,000
Earth	30,000

The outturn of stone is good, being 20,000 cubic feet in excess of any previous month but the expenditure in explosives has been very heavy, 1 lb. of gelignite producing only 61 cubic feet of stone. The matter is now being investigated and it is hoped that there will be great improvement in this respect during next season.

6. *Workshops.*—The six stone-crushers worked steadily, but only turn out about 2,500 cubic feet of broken stone per day ; mortar-mixing at a standstill here pending new arrangements.

7. *Mulya Panjan canal.*—Great activity has prevailed here and the work of repairs to masonry and earthworks, making new cuts, clearing silt, and repairing towpaths and its bridges has been in active progress and will be practically completed before cessation of work.

8. *Water-shed cutting.*—Outturn for March—

	C. FT.
Stone	34,124
Earthwork	21,000

A good month's work, the quantity of stone got out being 10,000 cubic feet in excess of the average monthly quantity. Sixty per cent. of the rock in this cutting has now been removed, leaving 40 per cent still to come. It has been found impossible to continue operations during the recess owing to the lack of supervision ; 8,000 cubic feet of masonry retaining wall were built during the month.

9. *Water-shed tunnel.*—The work during the month has been confined to No. 1 and 2 shafts.

At the former the heading running south to determine position of entrance to tunnel was advanced 24 feet and at No. 2 shaft the progress for the month was 108 feet on 27 working days or 4 feet per day, the same rate as for February. The boiler required for this shaft has been sanctioned and ordered.

The re-timbering of No. 1 shaft has been completed.

	FEET.
Total length of tunnel	5,643
Length completed to date	2,408
Balance ...	3,235

Of the above 2,408 feet, 1,400 feet have been driven in the working season 1891–92.

10. *Wire tramway.*—This work may be said to be completed. Spare posts to replace those which are rotten or destroyed are being collected.

PERIYAR, 8th April 1892. (Signed) W. B. DEWINTON, Supdt. of Works, No. I Periyár division

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Note by the Chief Engineer, Public Works Department.

Submitted for the information of Government.

2. The progress on the main dam has been very good and it seems probable that, in future, we may reckon on a monthly rate of progress of from 140,000 to 150,000 cubic feet.

3. The second of the two accidents mentioned by the Superintendent of Works is somewhat mysterious as the rope is of first-rate quality and of strength considerably more than sufficient for its work ; the most probable explanation is that it had been injured by the trucks having been allowed to run over it, but there is no direct evidence of this.

4. Mr. deWinton is mistaken in attributing the death of the fitter to this accident. The undersigned was at the Periyár when the death occurred ; the man's arm was broken, but he was progressing favorably and was about to be discharged from hospital when he died somewhat suddenly from bronchitis a week after the accident.

5. The progress on the tunnel has reached 1,400 feet during the season, and, as the steam-worked drills were not in full work till October, it is probable that in future seasons the progress will not be less than 1,600 feet, so that the tunnel ought to be completed by the end of 1893-94. The cutting will probably be completed about the same time.

6. Mr. deWinton does not mention the fault in the rock near the southern entrance to the tunnel, which has given so much trouble during the last few months. The end of this has been reached and solid rock found at a little above the level of the sill of the cutting ; the masonry retaining wall mentioned in the last part of para. 8 of the report is for supporting the earth on the sides of the cutting at this point.

MADRAS, 12th April 1892. (Signed) J. PENNYCUICK, Colonel, R.E., Chief Engineer, P.W.D.

ORDER—dated 19th April 1892, No. 388 I., Public Works.

Recorded and forwarded to the Government of India.

(Here enter No. 389 I., Public Works, dated 19th April 1892.)

(True Extract.)

(Signed) J. PENNYCUICK, Colonel, R.E., Secretary to Govt., P.W.D.

To the Superintendent of Works, Periyár Project.
„ Chief Engineer for Irrigation.
„ Revenue Department.

ENDORSEMENT—dated 19th April 1892, No. 389 I., Public Works.

Copy of the above forwarded for the information of the Government of India.

(By Order.)

(Signed) J. PENNYCUICK, Colonel, R.E., Secretary to Govt., P.W.D.

IRRIGATION.

Govt. of {1892} Madras.

PUBLIC WORKS.

Dated April, 19th.

Recd. *Encl.*

G.O., 19th April 1892, Nos. 388 I., 389 I.

APRIL.

Periyar Project

Forwarding copy of Proceedings recording note by the Chief Engineer, Public Works Department on the progress report of No. I Periyár division for March 1892.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

From Lieut.-Colonel A. C. SMITH, R.E., Superintending Engineer, VI Circle, to the Chief Engineer, Public Works Department, dated Trichinopoly, 6th April 1892, No. 2 P.R.

I have the honour to submit for sanction the accompanying supplemental estimate, amounting to Rs. 330, for building a culvert in the north approach to Nattam bridge for diverting the drainage water falling on the east side of the bridge to the culvert built on the west—*vide* sketch attached to the estimate. The estimate also includes some revetment, &c., to the banks and approaches.

2. The revised estimate for constructing the bridge across the Periyár main channel in the 7th Reach at 24 miles 7 furlongs and 480 feet has been sanctioned in G.O., No. 400 I., dated 11th May 1891, for Rs. 3,850. The supplemental amount now to be sanctioned is Rs. 330. Total of the sanction required, including supplementary, amount Rs. 4,180.

3. The culvert referred to will obviate the building of a culvert sanctioned in G.O., No. 824 I., dated 24th October 1891, for Rs. 3,300, and which has been requested to be cancelled in this office letter No. 705 P.R., dated 14th March 1892.

4. The rates are fair and the estimate is recommended for early sanction.

ORDER—dated 20th April 1892, No. 390 I., Public Works.

The following estimate is sanctioned from the balance of the amount reserved for unforeseen works of the Periyár project, which will then be reduced to Rupees 2,23,084 :—

Major Works (Construction).
49. Irrigation.
Periyár Project.
I. Works.
(2) Main Canals and Branches.
F. Cross Drainage Works.

	RS.
Constructing a culvert in the north approach to Nattam bridge estimate.	330

2. This sanction is registered as No. 11 I. of 1892–93.

(True Extract.)

(Signed) J. PENNYCUICK, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Chief Engineer for Irrigation.
" Superintending Engineer, VI Circle, with four enclosures.
" Examiner, Public Works Accounts.
" Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1892} Madras.

PUBLIC WORKS.

Dated April, 20th.

Recd. *Encl.*

G.O., 20th April 1892, No. 390 I.

APRIL.

Periyar Project

Estimate of Rs. 330 for constructing a culvert in the north approach to Nattam bridge, —, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper:—

From Lieut.-Colonel A. C. SMITH, R.E., Superintending Engineer, VI Circle, to the Chief Engineer, Public Works Department, dated Trichinopoly, 11th April 1892, No. 12 P.R.

I have the honour to submit for sanction a supplemental estimate for widening the shutter platform and protecting iron railings to the regulator at 7 miles 3 furlongs, 2nd reach, Main channel, Periyár project.

2. The original estimate was sanctioned in G.O., No. 373 I., dated 27th April 1891, for Rs. 10,500. Supplemental estimate now submitted is Rs. 500. Total of the sanction required including the supplementary amount Rs. 11,000.

3. This estimate provides for widening the shutter platform by two feet with iron railings; as the shutters are very large and heavy they will require some care in manipulation which cannot be given to these by lascars working on so narrow a platform as that originally designed.

ORDER—dated 20th April 1892, No. 391 I., Public Works.

The following estimate is sanctioned from the balance of the amount reserved for unforeseen works of the Periyár project, which will then be reduced to Rupees 2,22,584:—

Major Works (Construction).
49. Irrigation.
Periyár Project.
I. Works.
(2) Main Canals and Branches.
D. Regulators.

	RS.
Widening shutter platform and providing iron railings to the regulator at 7 miles 3 furlongs, 2nd Reach, Main Channel, estimate	500

2. This sanction is registered as No. 12 I. of 1892–93.

(True Extract.)

(Signed) J. PENNYCUICK, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Chief Engineer for Irrigation.
" Superintending Engineer, VI Circle, with four enclosures.
" Examiner, Public Works Accounts.
" Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1892} Madras.

PUBLIC WORKS.

Dated April, 20th.

Recd. *Encl.*

G.O., 20th April 1892, No. 391 I.

APRIL.

Periyar Project

Estimate of Rs. 500 for widening shutter platform and providing iron railings to the regulator at 7 miles 3 furlongs, 2nd reach, Main channel, —, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

From W. B. DEWINTON, Esq., Superintendent of Works, No. I Periyár division, to the Chief Engineer, Public Works Department, dated Periyár, 8th April 1892, No. 16 C.E.

I have the honour to submit a revised estimate, amounting to Rs. 6,200, for repairs and maintenance of tools and plant for 1891–92, and to inform you that the original estimate of Rs. 2,000, sanctioned by the late Superintendent of Works from the sum placed at his disposal to cover sanctions accorded by him to the estimates under tools and plant, has proved quite insufficient, the estimates sanctioned for repairs and maintenance of tools and plant for 1889–90 and 1890–91 being Rs. 5,000 and 7,000, respectively. I, therefore, request that the excess of Rs. 4,200 may be sanctioned from the balance available for tools and plant at your disposal.

ORDER—dated 20th April 1892, No. 392 I., Public Works.

The following revised estimate, amounting to Rs. 6,200, is sanctioned in supersession of the estimate of Rs. 2,000 previously sanctioned, the excess of Rs. 4,200 being met from the balance of the amount reserved for tools and plant required for the Periyár project, which will then be reduced to Rs. 2,760 :—

Major Works (Construction).
49. Irrigation.
Periyár Project.
III. Tools and Plant.
13. Repairs and Carriage.

	RS.
Repair and maintenance of tools and plant for 1891–92, estimate ...	6,200

2. This sanction is registered as No. 13 I. of 1892–93.

(True Extract.)

(Signed) J. PENNYCUICK, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Chief Engineer for Irrigation.
" Superintendent of Works, No I Periyár division,
with two enclosures.
" Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Govt. of {1892} Madras.

PUBLIC WORKS.

Dated April, 20th.

Recd. *Encl.*

G.O., 20th April 1892, No. 392 I.

APRIL.

Periyar Project

Revised estimate of Rs. 6,200 for repairs and maintenance of tools and plant for 1891-92 —, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

From J. HANNAN, Esq., Superintending Engineer, II Circle, to the Chief Engineer for Irrigation, dated Bezváda, 31st March 1892, No. 774 N.L.

I have the honour to forward, herewith, for early sanction of Government, an estimate, amounting to Rs. 16,200, for improvements to Karedu tank and supply channel (Imperial list No. 24) proposed to be carried out as a famine relief work, suitable provision not being available on minor tanks in the Nellore district.

2. The Executive Engineer reports that it will be necessary in all probability to start the work soon and at his request the earthwork plan has been returned him.

3. To save delay lump sums have only been entered in the estimate for sluices pending completion of plans, which are under preparation in the Division office and which the Executive Engineer promises to send as soon as possible along with the detailed estimates.

ENCLOSURE.

REPORT to accompany the plans and estimates for the Karedu tank and supply channel improvements.

		RS.
Amount of estimate	... ...	16,200
Date and cost of last repairs	... ...	Not known.

The tank (No. 24 in list of Imperial works) has a catchment area of 7½ square miles, but is also in great measure dependent for its supply on a channel from the Manneru river. The ayacut is 1,420 acres, yielding a revenue of Rs. 7,602, but, during the last few years, owing to bad seasons and the silted state of the channel, the average cultivation has been only 1,020 acres.

The channel will be adapted to carry 90 cubic feet a second in order to fill the tank in the 15 days which it is assumed will be in fresh. To regulate the supply from the river it is proposed to build a head sluice.

The existing tank calingulah being in very bad order, it is proposed to build a new weir, 140 feet long, with crest 1 foot below F.T.L. and fitted with shutters. The weir will be plastered with cement as the tank is not far from the sea.

The soil available for repair of the bund being sandy, 2 : 1 slopes are allowed. The level of the bund will be 4 feet above M.W.L. It has been necessary to provide a large sum for clearing prickly-pear from the bund and for planting vidavali.

Of the five sluices, the third and fourth require to be rebuilt, the first, second and fifth require to be repaired and new heads built. The designs made for the sluices are not satisfactory and as it will take some time to revise them lump sums are entered in order that sanction to the work, which is urgently required for famine relief, may not be delayed.

22nd March 1892.

(Signed) W. HUGHES
Ex. Engr., Nellore division.

No. 79 I.

Submitted to Government, with a recommendation, that the estimate of Rs. 16,200 be sanctioned.

(Signed) G. T. WALCH,
Chief Engineer for Irrigation.

ORDER—dated 20th April 1892, No. 393 I., Public Works.

The following estimate is sanctioned :—

Irrigation.
43. Minor Works and Navigation.
Minor Works for which neither Capital nor Revenue Accounts are kept, P.W.D.
Original Works.

	RS.
Improvements to Karedu tank and supply channel No. 24 of list of works in the Nellore division appended to G.O., No. 407 I., dated 6th July 1887, estimate	16,200

2. This sanction is registered as No. 14 I. of 1892-93.

(True Extract.)

(Signed) G. T. WALCH,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, II Circle, with 16 enclosures.
" Examiner, Public Works Accounts.
" Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1892} Madras.

PUBLIC WORKS.

Dated April, 20th.

Recd. *Encl.*

G.O., 20th April 1892, No. 393 I.

APRIL.

Karedu Tank

Estimate of Rs. 16,200 for improvements to — and supply channel in the Nellore division, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

From J. HANNAN, Esq., Superintending Engineer, II Circle, to the Chief Engineer for Irrigation, dated Bezváda, 1st April 1892, No. 1 N.L.

I have the honour to forward herewith, for sanction of Government, an estimate, amounting to Rs. 3,560, for improvements to Pákala old tank (Imperial list No. 14) in the Nellore district, proposed by the Executive Engineer to be carried out as a famine relief work during 1892–93.

2. The report accompanying estimate and Mr. O'Connell's letter to Executive Engineer, sent in original, explain the necessity for the work, and in the former, the Executive Engineer requests for an early sanction to the estimate.

ENCLOSURE.

REPORT to accompany the plans and estimates for the Pákala old tank improvements.

	RS.
Amount of estimate	3,560
Date and cost of last repairs	Not known.

This tank is No. 14 in the list of Imperial Works. The bund is in very bad order; one of the sluices requires reconstruction and the other repair and remodelling.

2. The existing weir, 61 feet long, is sufficient for the disposal of ordinary surplus During floods water has always escaped at different points on the left bank of the Vagu which brings in the surplus of the Raru tank. This system must be allowed to continue, in order to avoid swamping lands on the right bank of the Vagu. Mr. O'Connell, after inspecting the tank, recommends* that the bank from C.S. 1 to C.S. 8 should be abandoned and the ryots instructed to throw a small bund across the Vagu at C.S. 8 when necessary to maintain water at F.T.L.

* *Vide* his report, dated 7th March 1892.

3. As material for the repair of the bank is bad slopes 2 : 1 are provided.

4. There are two tamboyies in the escape. As these are practically useless and cause waste of water, they will be blocked up.

23rd March 1892,

(Signed) W. HUGHES,
Executive Engineer.

Early sanction is requested as the work is required for famine relief.

ORDER—dated 20th April 1892, No. 394 I., Public Works.

The following estimate is sanctioned :—

Irrigation.
43. Minor Works and Navigation.
Minor Works for which neither Capital nor Revenue Accounts are kept, P.W.D.
Original Works.

	RS.
Improvements to Pákala old tank, No. 14 of list of works in the Nellore division, appended to G.O., No. 407 I., dated 6th July 1887, estimate	3,560

2. This sanction is registered as No. 15 I. of 1892–93.

(True Extract.)

(Signed) G. T. WALCH,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, II Circle, with six enclosures.
" Examiner, Public Works Accounts.
" Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1892} Madras.

PUBLIC WORKS.

Dated April, 20th.

Recd. *Encl.*

G.O., 20th April 1892, No. 394 I.

APRIL.

Pakala Old Tank

Estimate of Rs. 3,560 for improvements to — in the Nellore division, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers :—

Resolution of the Government of India in the Public Works Department (Account—Irrigation), dated Calcutta, 18th March 1892, No. $\frac{3}{B.O.}$ A.—I.

Orders on the Budget Estimates of the Irrigation Branch, Madras, for 1892–93 *and the Revised Estimates for* 1891–92.

Read—the following papers :—

Letter from	the Secretary to the Govt.	of Madras,	dated			7th	Jan.	1892,	No.		27 I.
" to	"	"	"	"	"	25th	"	"	"		14 A.—I.
" from	"	"	"	"	"	6th	Feb.	"	"		117 I.
" "	"	"	"	"	"	9th	"	"	"		129 I.
" to	"	"	"	"	"	17th	"	"	"		33 A.—I.
Telegram from	"	"	"	"	"	29th	"	"	"		—
" to	"	"	"	"	"	1st	Mar.	"	"		47 A.—I.

Resolution—

The revised and budget estimates for 1891–92 and 1892–93, respectively, are passed for the sums entered in the following table :—

—	Actuals, 1890–91.	Budget estimate, 1891–92.	Revised estimate, 1891–92.	Budget estimate, 1892–93.
Receipts.	RS.	RS.	RS.	RS.
XXIX.—Major Works—Direct Receipts—Imperial	2,74,212	2,36,000	2,70,000	2,57,000
XXIX.—Major Works—Portion of Land Revenue due to Irrigation—Imperial	47,76,060	50,60,000	48,12,000	50,03,000
XXX.—Minor Works and Navigation—Provincial	1,39,359	1,25,000	1,47,000	1,50,000
Total ..	51,89,631	54,21,000	52,29,000	54,10,000
Charges.				
35.—Construction of Protective Irrigation Works—Imperial	4,54,570	3,50,000	6,40,000	4,50,000
42.—Major Works—Working Expenses—Imperial	12,52,368	11,52,000	11,74,000	11,96,000
43.—Minor Works and Navigation—Provincial	35,46,344	37,00,000	39,00,000	31,50,000
Incorporated Local	12,719	25,000	23,000	31,000
49.—Irrigation—Capital Expenditure not charged against Revenue—Imperial	15,79,883	13,75,000	15,40,000	13,00,000
Total ..	68,45,884	66,02,000	72,77,000	61,27,000

Order—

Ordered that this Resolution be communicated to the Government of Madras for information and guidance, with the request that 35* printed copies of the final issue of the budget estimate, as now passed, may be submitted so as to reach this office not later than 1st May 1892.

*10 copies to Simla and the remainder to Calcutta.

(Signed) R. G. MACDONALD,
Offg. Dy. Secy. to the Govt. of India.

Telegram from the Joint Secretary to the Government of Madras, Public Works Department, Irrigation Branch, to the Secretary to the Government of India, Public Works Department, dated 31st March 1892.

Your No. 3 A., 18th instant, budget orders. Please wire why revised estimate of revenue under Minor Works and Navigation increased from Rs. 1,40,000 to Rs. 1,47,000.

Telegram from the Secretary to the Government of India, Public Works Department, to the Joint Secretary to the Government of Madras, Public Works Department, Irrigation Branch, dated Calcutta, 1st April 1892, No. 46.

Your telegram 31st ultimo. Increase 7,000 in revised estimate of revenue under Minor Works and Navigation was warranted by approximate collections to end of February 1892 as shown in form D for that month.

Office-note to the Examiner of Public Works Accounts, dated 4th Apr. 1892, No. 1753 C.
" from " " " " 8th " " " 527 S.A.

ORDER—dated 20th April 1892, No. 395 I., Public Works.

Communicated to the Chief Engineer for Irrigation for information and guidance.

2. The increase of Rs. 500 in the past year's revised estimate of expenditure under 35. Protective Works, Irrigation, as adopted by the Government of India over that as submitted, will be added to the grant for the Rushikulya project under tools and plant.

3. The increase of Rs. 7,000 in the revised estimate of revenue from Minor Works and Navigation has, it is observed, been realized from Agricultural works.

(True Extract.)

(Signed) G. T. WALCH,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" all Superintending Engineers.
" the Examiner, Public Works Accounts.
" the Revenue Department.
" the Financial Department.

IRRIGATION.
ACCOUNT.

Govt. of {1892} Madras.

PUBLIC WORKS.

Dated April, 20th.

Recd. *Encl.*

G.O., 20th April 1892, No. 395 I.

APRIL.

Budget Estimates, Irrigation Branch, Madras

Orders of the Government of India on the — for 1892-93 and the revised estimates for 1891-92, communicated to the Chief Engineer for Irrigation with remarks.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper:—

From J. HANNAN, Esq., Superintending Engineer, II Circle, to the Chief Engineer for Irrigation, dated Bezváda, 4th April 1892, No. 34 K.S.

I have the honour to forward, herewith, for sanction of Government, a second revised estimate, amounting to Rs. 5,890, for "purchasing Cockburn's steam dredger and fitting it on punt No. 19, in supersession of the revised estimate for Rs. 5,400 sanctioned in G.O., No. 940 I., dated 9th December 1891.

2. The report accompanying explains the necessity for this revision.

ENCLOSURE.

REPORT to accompany the second revised estimate for purchasing a Cockburn's steam dredger and fitting it on punt No. 19.

	RS.
Amount of revised estimate	5,980

An estimate, amounting to Rs. 5,400, for purchasing a Cockburn's steam dredger, size A, was sanctioned in G.O., No. 940 I., dated 9th December 1891, in supersession of the estimate of Rs. 4,800, sanctioned in G.O., No. 523 I., dated 29th October 1889.

2. During the execution of the work it was found that the sum of Rs. 350, provided in the estimate sanctioned in G.O., No. 940 I., dated 9th December 1891, for strengthening hull and deck and fitting machinery, is too small. Consequently this revised estimate is submitted for your approval and sanction.

(Signed) W. JOPP,
Ex. Engr., Eastern Division, Kistna.

26th March 1892.

ORDER—dated 20th April 1892, No. 396 I., Public Works.

The following revised estimate, amounting to Rs. 5,890, for purchasing a Cockburn's steam dredger, size A, is sanctioned in supersession of the estimate of Rs. 5,400, sanctioned in G.O., No. 940 I., dated 9th December 1891, the excess of Rs. 490 being met from the balance of the lump sum provision for tools and plant of the Kistna delta system, which will then be reduced to Rs. 1,57,164.

Major Works (Construction).
49. Irrigation.
Kistna Delta System.
Eastern Section.
III. Tools and Plant.
(12) Miscellaneous.

	RS.
Purchasing a Cockburn's steam dredger, size A, estimate	5,890

2. This sanction is registered as No. 16 I. of 1892–93.

(True Extract.)

(Signed) G. T. WALCH,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, II Circle, with three enclosures.
" Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Govt. of {1892} Madras.

PUBLIC WORKS.

Dated April, 20th.

Recd. *Encl.*

G.O., 20th April 1892, No. 393 I.

APRIL.

Cockburn's Steam Dredger

Revised estimate, amounting to Rs. 5,890, for purchasing a —, size A, for the Kistna canals, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following paper :—

From Lieut.-Colonel A. C. SMITH, R.E., Superintending Engineer, VI Circle, to the Chief Engineer for Irrigation, dated Trichinopoly, 25th March 1892, No. 1355 M.D.

With reference to para. 3 of your note No. 201 I., dated 20th December 1890, printed with G.O., No. 26 I., dated 9th January 1891, I have the honour to submit, for your approval and sanction of Government, a revised estimate, amounting to Rs. 11,000, with comparative statement and reports, for constructing a new anicut across the Suruliyár at the head of the Kottur channel and a new head sluice to the channel, Madura district.

2. The estimate now submitted is in lieu of the one amounting to Rs. 9,900 sanctioned in the G.O. above referred to.

3. The cause of excess, viz., Rs. 1,100, over the original estimate, is due to the extension of the anciut by 20 feet so as to get a good earth connection at the left flank and also to the higher rates for old and new stone. Masonry works were found necessary.

4. The rates entered are fair and the estimate is recommended for early sanction.

Report to accompany the revised estimate for constructing a new anicut across the Suruliyár at the head of No. 62 Kottur channel and a new head sluice to the channel.

	RS.
Estimate	11,000

The revised estimate has been prepared in accordance with the instructions of the Chief Engineer for Irrigation printed with G.O., No. 26 I., dated 9th January 1891.

2. The foundations have not been spread where laid in rock. As there are a number of cut stones at site, they will be used for the apron instead of concrete, and for this arrangement the subsequent permission of the Chief Engineer for Irrigation was obtained. The level of the apron had to be kept at 32·50 owing to difficulties experienced in keeping down the water.

3. Since the preparation of the original estimate it has been found necessary to extend the anicut by 20 feet so as to get a good earth connection at the left flank.

4. The rates for masonry have also had to be raised, and these two causes have resulted in an excess of Rs. 1,100 over the amount sanctioned in G.O., No. 26 I., dated 9th January 1891.

(Signed) A. H. GARRETT,
Executive, Engineer, Madura Division.

9th February 1892.

No. 78 I.

Submitted to Government with a recommendation that the revised estimate of Rs. 11,000 be sanctioned.

Chepak,
12th April 1892.

(Signed) G. T. WALCH,
Chief Engineer for Irrigation.

To the Joint Secretary to Government,
Public Works Department, Irrigation Branch.

Order—dated 22nd April 1892, No. 400 I., Public Works.

The following revised estimate is sanctioned in supersession of the estimate of Rs. 9,900 sanctioned in G.O., No. 26 I., dated 9th January 1891 :—

Irrigation.
43. Minor Works and Navigation.
Minor Works for which neither Capital nor Revenue Accounts are kept.
Madura Division Original Works.

1. Constructing a new anicut across the Suruliyár at the head of the Kottur channel and a head sluice to the channel.

	RS.
Estimate	11,000

2. This sanction is registered as No. 17 I. of 1892-93.

(True Extract.)

(Signed) G. T. WALCH,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, VI Circle, with 13 enclosures.
" Examiner, Public Works Accounts.
" Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1892} Madras.

PUBLIC WORKS.

Dated April, 22nd.

Recd. *Encl.*

G.O., 22nd April 1892, No. 400 I.

APRIL.

Kottur Channel

Revised estimate of Rs. 11,000 for constructing a new anicut across the Suruliyár at the head of the — and a head sluice to the channel, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

From J. HANNAN, Esq., Superintending Engineer, II Circle, to the Chief Engineer for Irrigation, dated Bezváda, 22nd March 1892, No. 511 B.C.

I have the honour to forward, herewith, a revised estimate, amounting to Rs. 11,800, for improvements to Buckingham canal in miles 78 to $\frac{89}{0\frac{1}{2}}$, and to request that sanction of Government may be obtained for the same in lieu of Rs. 24,200 sanctioned in the project estimate (*vide* item 13, section III, northern canal, in summary of estimates printed with G.O., No. 218 I. of 9th April 1890), the saving of Rs. 12,400 being credited to the balance for unforeseen works of the canal at disposal of Government.

2. The necessity for the work is explained in the report which accompanied the estimate.

ENCLOSURE.

REPORT to accompany revised estimate for improvements to canal in miles 78 to $\frac{89}{0\frac{1}{2}}$, northern canal.

	RS.
Amount of estimate	11,800

The original estimate of Rs. 24,200 was sanctioned in the project estimate (*vide* item 13, section III, northern canal, in the summary of estimates printed with G.O., No. 218 I. of 9th April 1890).

2. This estimate provided for improving the canal by deepening it to 3 feet below L.R.T. by cutting the slopes, towpaths and berms to proper section, and also by raising the banks where necessary (especially in miles $\frac{88}{vi}$ to $\frac{89}{0\frac{1}{2}}$ where the canal is exposed to the Kandaleru floods) to full height, viz., 4 feet + H.F.L. or 27·15.

3. The whole of this reach has been widened to a great extent owing to the continual erosion of banks caused by the daily and very rapid rush of tides up and down it from the Kandaleru bar, which never closes and has at all times a strong and deep flow over it. The estimate now submitted makes provision as follows in accordance with the instructions of the Chief Engineer for Irrigation embodied in G.O., No. 623 I. of 17th December 1889, section III, paragraph 3, item 2 :—

(*a*) Trimming and levelling old towpaths and eroded water slopes down to H.S.T. level in places where the earth stands perpendicular, or nearly so, and is continually falling in bit by bit.

(*b*) Raising banks where necessary, and in miles 87 to 89, and sloping back the top of banks throughout so as to prevent the rain-water falling towards the canal and gullying the towpaths and water slopes.

(*c*) Ramps for village crossings.

(*d*) Removing cane and objectionable vegetation.

(*e*) Turfing water slopes throughout and front slopes of banks where necessary.

(*f*) Planting Rabbit wort where necessary and on sandy portions where turf will not grow.

4. There are several gaps in banks. Provision is made for some of them to be converted into open inlets and to be furnished with foot-bridges of good thick casuarina wood well dowelled together, while other gaps will be closed and provided with pottery pipes of sufficient sizes to

pass drainage. The pipes will be provided with masonry face walls in front and rear. In places where existing pipes are damaged, or are insufficient to carry off drainage, or are not properly laid, they will be taken up, and such new pipes as are necessary provided.

5. Clearance of silt provided in the original estimate is not required, as it has been done under Canal Maintenance and Repairs.

6. The savings of Rs. 12,400 as per comparative statement will be added to the reserve at the disposal of Government.

(Signed) A. S. RUSSELL,
Ex. Engr., Buckingham Canal division.

5th March 1892.

No. 80 I.

Submitted to Government with a recommendation that the revised estimate of Rs. 11,800 be sanctioned.

CHEPÂK,
20th April 1892.

(Signed) G. T. WALCH,
Chief Engineer for Irrigation.

To the Joint Secretary to Government,
Public Works Department, Irrigation Branch.

ORDER—dated 25th April 1892, No. 401 I., Public Works.

The following revised estimate is sanctioned in supersession of the provision of Rs. 24,200 made for improvements to the Buckingham canal from 77 miles 1 furlong to 89 miles $\frac{1}{2}$ furlong in the "summary of estimates" printed in Proceedings of the Madras Government, No. 218 I., dated 9th April 1890, the saving of Rs. 12,400 effected by the present estimate being added to the balance of the amount reserved for unforeseen works which will then be increased to Rs. 1,70,840 :—

Irrigation.
43. Minor Works and Navigation.
Minor Works for which Capital and Revenue Accounts are kept.
Capital Account.
Buckingham Canal.
Northern Portion.
Section III.
(2) Main Canals and Branches.
L. Earthwork.

	RS.
Improvements to canal in miles 78 to $\frac{89}{0\frac{1}{2}}$, estimate	11,800

2. This sanction is registered as No. 18 I. of 1892-93.

(True Extract.)

(Signed) G. T. WALCH,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, II Circle,
with five enclosures.
,, Examiner, Public Works Accounts.
,, Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1892} Madras.

PUBLIC WORKS.

Dated April, 25th.

Recd. *Encl.*

G.O., 25th April 1892, No. 401 I.

APRIL.

Buckingham Canal

Revised estimate of Rs. 11,800 for improvements to the — in miles 78 to $\frac{89}{0\frac{1}{2}}$, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—again the following paper :—

G.O., dated 23rd May 1887, No. 21 I., Public Works.

READ—also the following papers :—

From J. W. MARTIN, Esq., Superintending Engineer, III Circle, to the Chief Engineer for Irrigation, dated Dharmavaram, 20th February 1892, No. 3313.

Adverting to your memorandum No. III/16 C.D., dated 8th August 1891, in the matter of Kanchalamah tank in Ráyachóti taluk, Cuddapah district, I have the honour to forward an estimate, amounting to Rs. 36,800, for completing it.

2. From letter, dated 25th April 1877, No. 955, from the Collector of Cuddapah, embodied with G.O., dated 23rd May 1877, No. 21 I., it appears that in olden times a tank was made, or an attempt was made to construct one, by throwing a bank across the Mandavi river at a site about $2\frac{1}{2}$ miles south-east of Ráyachóti, and that the tank was named Kanchalamah. It is reported that the work is one of considerable antiquity and that the bank breached more than a hundred years before the date of the Collector's letter, and, apparently, no attempt was made since the bank was breached to close the breaches and restore the tank.

3. During the famine of 1876–77 the work of restoring the tank was taken up as a relief work, but, after it had been in progress for some time, the Public Works officer in charge reported that the restoration of the tank had been taken up without due inquiry as to the agricultural advantages to be derived from it. This led to some correspondence regarding what should be done and Government passed an order, dated 11th May 1877, No. 1700 A., that the lesser breach should be closed and all repairs to the bank, including re-formation of the revetment, should be carried out, but that the principal breach should be left open pending the provision of adequate escapes. The works, as laid down by Government, appear to have been carried out, the outlay being Rs. 70,800, while the normal value of the work is estimated as amounting to only Rs. 35,300. Apparently nothing has been done towards restoring the tank since the work was stopped after the famine of 1876–77 beyond preparing the estimate I am now forwarding.

4. The drainage area or basin above the site of the tank is about 100 square miles and the number of existing tanks lying within this area is twenty-seven; fifteen on the left side and twelve on the right side of the river—so roughly there is already one tank to every four square miles of the drainage area.

5. What is now required to restore the tank and bring it into operation is to (1) close the principal breach; (2) build two sluices, one at each of the small openings existing in the bank; and (3) provide an escape, 254 feet long, at left end of the bank and an escape, 118 feet long, at the right end. There is rock at each end of the bank. The estimate now forwarded provides for the items just mentioned.

6. Regarding the principal breach, it is where the river crosses the bank that this breach exists. At present there is sand in the bed of the river at the breach, but there is rock below the sand, the average depth of sand over the rock being about 9

feet. The average level value for the rock is 151·00 above datum against 196·00, the level proposed for the top of the bank. As all the sand over the rock should be removed before the filling in of the breach is commenced, the actual depth of filling will be about 45 feet which is a formidable depth to overcome. If the tank fills, the depth of water over the rock will be 36·50 feet and the pressure resulting from this depth will be considerable. In these circumstances it is necessary to specially provide against leakage either through or under the bank at the breach. The estimate provides for removing all the sand over the rock and refilling with good selected earth providing in the centre along the whole length of the breach a puddle wall, 17 feet wide at bottom and rising up to one foot above M.W.L. I think this arrangement will be found to answer satisfactorily.

7. Regarding the sluices these will be of the usual pattern but will be provided with screw gearing for raising the shutter and cutstone flooring for a length of 25 feet behind from the shutter, for the depth of water against the shutter will be considerable and the velocity through the tunnel high.

8. The escape or weir at each end of the bank will be a simple work, all that is required being to level the rock and build a simple wall at some low places. The total length of the two weirs is 372 feet. This length is, I think, sufficient. The Executive Engineer estimates the maximum surplus discharge from the tank at 12,648 cubic feet per second and this quantity, he observes, will be discharged with a head of about 4½ feet over the weirs. The depth 4¼ feet would hardly be sufficient to discharge 12,648 cubic feet, for there will not be a clear overfall over at each weir; but it may be accepted, for it is improbable the surplus water will ever be as much as 12,640 cubic feet per 1″, for the 27 tanks lying in the drainage area of the river will certainly act to some extent as flood moderators and these tanks have not been taken into account by the Executive Engineer.

9. Regarding the question whether it is desirable to restore the tank at all, it will be seen from para. 6 of the report that, according to the levels fixed, if the tank fills once, it will irrigate about 282 acres and if more than once say about 600 acres. This, however, does not take into account that it is only a question of time when the bed must sand up very considerably, for the river will certainly bring in large quantities of sand. Moreover, as there are already twenty-seven tanks above the site of Kanchalamah tank, I think there will not be, in ordinary years, at all events, much water available for it. Taking all this into consideration I am of opinion that the benefit resulting from restoring the tank would not be commensurable with the expense. I may mention this is also the opinion of the District Engineer of Cuddapah expressed in letter No. 654, dated 13th June 1877, addressed to the Chief Engineer for Irrigation.

10. There is another important point that should be considered in connection with the question of restoring the tank. It is this, that there are at present three spring channels proceeding from the bed through the breach and the total annual assessment of the land irrigated by these channels is Rs. 783 according to the particulars given in G.O., dated 8th April 1879, No. 241 I. Now if the tank should be restored, I think these channels will be closed up with sand and will become practically useless which would be a serious loss, for spring channels, as a rule do not become dry even in years when there is a failure of rain, so they are specially valuable in times of drought.

No. 82 I.

Note by the Chief Engineer for Irrigation.

It is evident that the restoration of the Kanchalamah tank is not worth undertaking and I recommend that the idea of carrying it out be once for all abandoned.

CHEPÂK,
21st April 1892.

(Signed) G. T. WALCH,
Chief Engineer for Irrigation.

To the Joint Secretary to Government,
Public Works Department, Irrigation Branch.

ORDER—dated 27th April 1892, No. 407 I., Public Works.

The proposal for restoration of the Kanchalamah tank, Ráyachóti taluk, Cuddapah district, will be abandoned.

(True Extract.)

(Signed) G. T. WALCH,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, III Circle, with twenty-six enclosures.
,, Examiner, Public Works Accounts.
,, Revenue Department.

IRRIGATION.
ACCOUNT.

Gobt. of {1892} Madras.

PUBLIC WORKS.

Dated April, 27th.

Recd. *Encl.*

G.O., 27th April 1892, No. 407 I.

APRIL.

Kanchalamah Tank

Directing that the proposal for restoration of the — in the Ráyachóti taluk, Cuddapah district, be abandoned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

From Lieut.-Colonel R. R. E. DRAKE-BROCKMAN, R.E., Superintending Engineer, IV Circle, to the Chief Engineer for Irrigation, dated 16th April 1892, No. 90/E.I.

Adverting to para. 2 of G.O., No. 134 I., dated 11th February 1892, I have the honour to forward, herewith, a statement showing the distribution by component works of the reduced grant of Rs. 5,065 for works connected with the Barúr Tank Project.

ENCLOSURE.

SCHEDULE showing the component works of the budget items for 1891–92.

Items.	Main head.	Name of canal.	Sub-head.	Individual works.	Amount of estimate.	Outlay: To end of 1890–91.	Outlay: Probable during 1891–92.	Grant for 1891–92.	Item Total.
					RS.	RS.	RS.	RS.	
1	Main Canals and Branches.	..	B. Lands.	Compensation for land for Barur Project Works ..	10,774	10,753	180	180	
2	I Head Works.	Ponniar anicut.	C. Works.	Anicut across the Ponniar at Nedungal	21,262	21,146	75	75	
3	III. Distributaries.	..	O. Miscellaneous.	Constructing 60 distributary sluices	7,025	5,635	1,230	1,230	
4	Do. ..	..	Do. ..	Constructing 19 masonry falls	2,690	2,050	350	350	
5	II. Main Canals and Branches.	Agaram Channel.	L. Earthwork.	Cutting new head to Agaram channel ..	5,710	4,525	600	600	
6	III. Distributaries.	..	O. Miscellaneous.	Constructing 35 outlets and 6 terminals	12,948	11,559	50	50	
7	III. Do. ..	..	Earthwork.	Cutting Keelkuppam East main channel	27,600	27,311	300	300	
8	Do. ..	Do. Branch channel.	Do. ..	Do. do. Branch channel No. 3	10,700	10,617	90	90	
9	II. Main Canals and Branches.	Barur tank.	D. Regulators.	Providing 2 regulators to the supply channel of Barur tank	2,770	..	2,190	2,190	
									5,065

N.B.—This work is classified under 42. Major Works E. and I., but in G.O., No. 61 I. of 21st January 1892, as it is included with those under 49. Irrigation, it is noted here accordingly.

ORDER—dated 27th April 1892, No. 408 I., Public Works.

The distribution statement is approved.

(True Extract.)

(Signed) G. T. WALCH,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, IV Circle.
„ Examiner, Public Works Accounts.
„ Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1892} Madras.
PUBLIC WORKS.

Dated April, 27th.

Recd. *Encl.*

G.O., 27th April 1892, No. 408 I.

APRIL.

Barur Tank Project

The distribution statement of the grant for —, Salem district, for 1891-92, approved.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following paper :—

Letter from the Superintending Engineer, I Circle, dated 8th Jan. 1892, No. 1242 G.N.
Memorandum to „ „ „ „ 16th „ „ „ I/5 G.N.

From G. D. WYBROW, Esq., Superintending Engineer, I Circle, to the Chief Engineer for Irrigation, dated Madavaborida, 8th March 1892, No. 1420 G.N.

With reference to your memo. No. I/5. G.N., dated the 16th January 1892, I have the honour to return the estimate for a bridge over the Rushikulya canal on the Berhampore-Aska road altered from 3 spans of 20 feet to 2 spans of 25 feet, which is sufficient.

2. The bottom breadth of the canal at the proposed site of the bridge is 50 feet; with a depth of water of 6 feet, the velocity will be 1·72 feet per second. Through the bridge of 2 spans of 25 feet the velocity will be 2·12 feet per second. This higher velocity is unobjectionable, as it is not proposed that the canal should be navigable beyond the bridge.

3. The bridge, as now proposed, will consist of 2 spans of 25 feet with a roadway of 13 feet clear.

No. 83 I.

Submitted to Government. The revised estimate has been reduced in this office from Rs. 4,600 to Rs. 4,500.

Chepâk,
21st April 1892.

(Signed) G. T. WALCH,
Chief Engineer for Irrigation.

To the Joint Secretary to Government,
Public Works Department, Irrigation Branch.

Order—dated 27th April 1892, No. 409 I., Public Works.

The following revised estimate, amounting to Rs. 4,500, for a bridge over the Rushikulya canal on the Berhampore-Aska road is sanctioned in lieu of the provision of Rs. 4,800 made for the work in the revised estimate for the Rushikulya Project printed in Proceedings of the Madras Government, No. 482 I., dated 4th September

1890, the saving of Rs. 300 effected by the present estimate being added to the balance of the amount reserved for unforeseen works which will then be increased to Rs. 67,658.

Famine Relief and Insurance.
35. Protective Irrigation Works.
Rushikulya Project.
I. Works.
(2) Main Canals and Branches.
Rushikulya canal.
G. Bridges.

	RS.
Bridge to carry Aska-Berhampore road at 36 miles, estimate ...	4,500

2. This sanction is registered as No. 19 I. of 1892–93.

(True Extract.)

(Signed) G. T. WALCH,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, I Circle, with eight enclosures.
" Examiner, Public Works Accounts.
" Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1892} Madras.

PUBLIC WORKS.

Dated April, 27th.

Recd. *Encl.*

G.O., 27th April 1892, No. 409 I.

APRIL.

Bridge

Revised estimate of Rs. 4,500 for a — to carry Aska-Berhampore road at 36 miles of the Rushikulya canal, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

From G. D. WYBROW, Esq., Superintending Engineer, I Circle, to the Chief Engineer for Irrigation, dated Dowlaishweram, 4th April 1892, No. 41 G.N.

I have the honour to submit, herewith, a plan and an estimate, amounting to Rs. 11,700, for constructing an under tunnel No. 20 at 30½ miles + 140 feet, Rushikulya canal, and to request that you will be so good as to obtain the early sanction of Government to the same.

2. A lump sum of Rs. 13,300 has been sanctioned for this work in G.O., No. 482 I., dated the 4th September 1890.

No. 81 I.

Submitted to Government with a recommendation that the estimate of Rs. 11,700 be sanctioned.

CHEPÂK,
22nd April 1892.

(Signed) G. T. WALCH,
Chief Engineer for Irrigation.

To the Joint Secretary to Government,
Public Works Department, Irrigation Branch.

ORDER—dated 27th April 1892, No. 410 I., Public Works.

The following estimate, amounting to Rs. 11,700, for constructing an under tunnel No. 20 at 30½ miles and 140 feet, Rushikulya canal, is sanctioned in lieu of the provision of Rs. 13,300 made for the work in the revised estimate for the Rushikulya project printed in Proceedings of the Madras Government, No. 482 I., dated 4th September 1890, the saving of Rs. 1,600 effected by the present estimate being added to the balance of the amount reserved for unforeseen works, which will then be increased to Rs. 69,258.

Famine Relief and Insurance.
35. Protective Irrigation Works.
Rushikulya Project.
I. Works.
(2) Main Canals and Branches.
Rushikulya Canal.
F. (1) Other Cross Drainage Works.

	RS.
Constructing an under tunnel No. 20 at 30½ miles and 140 feet, estimate	11,700

2. This sanction is registered as No. 20 I. of 1892–93.

(True Extract.)

(Signed) G. T. WALCH,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, I Circle, with six enclosures.
" Examiner, Public Works Accounts.
" Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1892} Madras.

PUBLIC WORKS.

Dated April, 27th.

Recd. *Encl.*

G.O., 27th April 1892, No. 410 I.

APRIL.

Rushikulya Project

Estimate of Rs. 11,700 for constructing an under tunnel No. 20 at $30\frac{1}{2}$ miles and 140 feet, Rushikulya canal, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

From G. D. WYBROW, Esq., Superintending Engineer, I Circle, to the Chief Engineer for Irrigation, dated Dowlaishweram, 12th April 1892, No. 72 G.N.

I have the honour to submit, herewith, an estimate of Rs. 120 for excavating channels from irrigation sluice No. 5, Rushikulya canal, Rushikulya project, and to request that you will be good enough to obtain the sanction of Government to the same.

2. These are two small channels to lead water to the fields above (up stream) and below (down stream) the sluice.

3. The amount of the estimate is to be met from the lump sum provision of Rs. 83,520 provided for irrigation channels under Distributaries, L. Earthwork, of the Rushikulya canal in G.O., No. 482 I., dated 4th September 1890.

ORDER—dated 28th April 1892, No. 411 I., Public Works.

The following estimate is sanctioned from the sum of Rs. 83,520 provided for irrigation channels of the Rushikulya canal in the revised estimate for the Rushikulya project printed in Proceedings of the Madras Government, No. 482 I., dated 4th September 1890 :—

Famine Relief and Insurance.
35. Protective Irrigation Works.
Rushikulya Project.
I. Works.
Rushikulya Canal.
(3) Distributaries.
L. Earthwork.

	RS.
Channel from irrigation sluice No. 5, estimate	120

2. This sanction is registered as No. 21 I. of 1892–93.

(True Extract.)

(Signed) G. T. WALCH,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, I Circle, with two enclosures.
,, Examiner, Public Works Accounts.
,, Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1892} Madras.

PUBLIC WORKS.

Dated April, 28th.

Recd. *Encl.*

G.O., 28th April 1892, No. 411 I.

APRIL.

Channel

Estimate of Rs. 120 for a — from irrigation sluice No. 5, Rushikulya canal, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following paper :—

From Lieut.-Colonel A. C. SMITH, R.E., Superintending Engineer, VI Circle, to the Chief Engineer, Public Works Department (through the Examiner, Public Works Accounts), dated Trichinopoly, 16th April 1892, No. 18 P.R.

I have the honour to forward copy of letter from the Executive Engineer, No. II Periyár division, No. 522, dated 26th March 1892, applying for permission to write off Rs. 131–5–7, being the value of 2,189 cubic feet of stone jelly, collected for the culvert at 3 miles and 3 furlongs in the first reach of the Periyár main channel and since washed away by a breach in the Mattaparai tank bund.

2. Under the circumstances, I have instructed the Executive Engineer to write off the amount and request that the sanction of Government may be obtained under Code para. 1973, as the loss exceeds Rs. 100.

Enclosure.

From the Executive Engineer, No. II Periyár division, to the Superintending Engineer, VI Circle, dated 26th March 1892, No. 522.

I have the honour to request permission to write off Rs. 131–5–7, value of 2,189 cubic feet of stone jelly collected for the culvert at 8 miles 3 furlongs in the first reach, main channel.

2. The material was not used owing to the front portion of the work being sloped down and also because hard soil was met with which allowed a saving in the concrete provided for the foundation. It was, however, to have been utilized for metalling the roadway of the bridge at the fourth mile.

3. On the 17th October last the Mattaparai tank bund breached and the water from this breach destroyed the banks of the main channel and washed away the concrete in question which was stacked on the berm of the channel.

4. It was at first thought that some of the materials would be recoverable and I therefore waited until the channel was dry to ascertain the quantity lost which is as above stated.

5. As you have now inspected the place I request early permission to write the amount off to close the accounts of the work.

Office-note from the Examiner, Public Works Accounts, dated 25th April 1892, No. 597 S.A.

Forwarded. There is no objection to Government sanctioning the loss being written off from "materials at site" to debit of an appropriate sub-head of the work.

Order—dated 28th April 1892, No. 412 I., Public Works.

Sanctioned.

2. The Superintending Engineer, VI Circle, will settle the sub-head to which the value of materials lost should be charged.

(True Extract.)

(Signed) J. PENNYCUICK, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Chief Engineer for Irrigation.
" Superintending Engineer, VI Circle.
" Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Govt. of {1892} Madras.

PUBLIC WORKS.

Dated April, 28th.

Recd. *Encl.*

G.O., 28th April 1892, No. 412 I.

APRIL.

Periyar Project

Stone jelly collected for the culvert at 3 miles 3 furlongs, first reach.—Proposal to write off Rs. 131–5–7, being the value of — and since washed away by a breach in a tank bund, sanctioned with remarks.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper:—

From G. D. WYBROW, Esq., Superintending Engineer, I Circle, to the Chief Engineer for Irrigation, dated Dowlaishweram, 29th March 1892, No. 5 G.D.

I have the honour to bring to your notice that for several years past the Public Works Department lands at Dumagudem in Godávari Eastern division, referred to in the enclosed statement, have been leased out annually by this department for cultivation and the same course was adopted for 1891–92.

2. The lands in question not having been cultivated during 1891–92 by the ryots owing to want of rains, the Executive Engineer, Eastern division, applied for for the assessment (Rs. 36–14–10) on those lands being written off the accounts and it was accordingly sanctioned by me.

3. The Examiner, Public Works Accounts, has asked in his letter No. 72 S.E.,* dated the 15th February 1892, whether the sanction of Government should not be obtained for the remission, there being no rule apparently under which the same can be remitted.

* Copy enclosed.

I, therefore, request that you will be so good as to obtain the requisite sanction of Government, if necessary, to the assessment (Rs. 36–14–10) being written off the statement of collections of land assessment under the reasons explained.

4. I take this opportunity of asking you whether the lands in question may be temporarily made over to the Revenue Department to be let out on yearly leases with power to resume on due notice being given.

ENCLOSURES.

STATEMENT of collection of land assessment for the year ending 31st March 1892 for the month of December 1891.

Survey No.	Name of cultivators.	Extent.	Assessment due.	Assessment paid.	Date of payment.	Balance due.	Remarks.
	Dumagudem block.	ACS.	RS. A. P.	RS. A. P.		RS. A. P.	
..	Balance			Nil.			
	Lime-kiln block.						
..	Balance			Nil.			
	Lunka block.						
1	Kumma Thammiah	3·25	8 2 0	..	..	8 2 0	None of these lands has been cultivated this season owing to want of rain and the amount shown here as due has therefore to be written off the returns.
2	Voondoor Gunguloo	3·40	8 8 0	..	..	8 8 0	
3	Voondoor Gunguloo	·81	2 0 5	..	..	2 0 5	
4	Voondoor Gunguloo	·70	1 12 0	..	..	1 12 0	
5	Kumma Thammiah	·65	1 10 0	..	..	1 10 0	
7	Peddada Guravadoo	·29	0 11 7	..	..	0 11 7	
21	Golagani Anckiah	1·50	3 12 0	..	..	3 12 0	
22	Gentada Thibbadu	·25	2 6 0	..	..	2 6 0	
23	Peddada Somadu	·79	1 15 7	..	..	1 15 7	
24	Maradupoody Pedduloo	1·37	3 6 10	..	..	3 6 10	
25	Maradupoody Pedduloo	1·60	2 10 5	..	..	2 10 5	
	Total ..	..	..	..	..	36 14 10	
	Gungole block.						
..	Balance			Nil.			

DUMAGUDEM,
5th January 1892.

(Signed) V. SUBRAHMANYA SASTRI
Overseer.

No. 666 S.

Forwarded to the Superintending Engineer, I Circle, for favour of according sanction for the sum of Rs. 36–14–10 being written off the returns under the circumstances explained by the overseer in the remark column of the statement.

2. The overseer was informed that he was in error in bringing the items on the returns submitted to the Examiner before the ryots commenced cultivation of the lands.

(Signed) C. M. SMITH,
Ex. Engr., Godávari Eastern division.

10th January 1892.

Order—dated 29th April 1892, No. 415 I., Public Works.

The action of the Executive Engineer in remitting the rents is sanctioned.

2. The suggestion made in para. 4 of the Superintending Engineer's letter is approved.

(True Extract.)

(Signed) G. T. WALCH,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, I Circle.
,, Examiner, Public Works Accounts.
,, Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1892} Madras.

PUBLIC WORKS.

Dated April, 29th.

Recd. Encl.

G.O., 29th April 1892, No. 415 I.

APRIL.

Public Works Department Lands at Dumagudem

The remission of assessment of Rupees 36–14–10 on certain — in the Godávari Eastern division sanctioned and the Superintending Engineer's suggestion of transferring temporarily, on certain conditions, the lands to the Revenue Department approved.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers:—

Memo. to the Superintending Engineer, II Circle, dated 1st September 1891, No. II-40 K.S.

From J. HANNAN, Esq., Superintending Engineer, II Circle, to the Chief Engineer for Irrigation, dated Bezváda, 21st March 1892, No. 734 N.L.

With reference to your memo. No. II-40 K.S. of 1st September 1891, I have the honour to submit herewith an estimate amounting to Rs. 30,850 for improvements to Kota Penaka tank in Gúdúr taluk, Nellore district, Item No. 235 in the list of Imperial tanks, for your approval and sanction of Government.

2. The necessity for the work has been explained in the report accompanying the estimate.

3. A copy of the Collector's letter, No. 3488-Ver., of 29th November 1891, furnishing the financial aspect of the scheme, is enclosed.

4. I also forward an estimate amounting to Rs. 8,300 for improving Chellakalva left embankment, which may be sanctioned under Agricultural Original Works, Major. The work is only required in connection with the Kota Penaka Tank Project, but as it is to be charged to a different head, a separate estimate has been prepared for it.

5. The Collector in his letter No. 668-Ver., dated 26th February 1892, informs me that it is not now necessary to execute the work as a famine relief work.

ENCLOSURES.

Public Works Department, II Circle.

REPORT to accompany the plans and estimates for the Kota Penaka Tank Improvements.

	RS.
Amount of estimate	30,800
Date and cost of last repairs	Not known.

The Kota Penaka tank is a large tank situated about 16 miles west of Gúdúr. It has an ayacut of 2,400 acres, which has been fully cultivated up to the present year, and a surplus supply has always remained in the tank for the commencement of the next year's irrigation. This year and last year the seasons have been very unfavorable for irrigation, and this is the first year that the tank has been completely dry within the memory of the people living in the vicinity. This large tank is in danger of being ruined, as at present there is no means to control the supply from the Chellakalva. This supply-channel (marked A on sketch) from the Chellakalva was in old times small in section, and the supply into the tank could be controlled by throwing a bund across it; but in the course of years this supply-channel has widened, and it is now so wide that it is impossible to control the amount of water entering the tank. The Chellakalva itself has also become much wider from the point where it takes off from Swarnamuki river to the point where the supply-channel (A) enters the tank. Owing to this widening of the Chellakalva and supply-channel to the tank, a vast body of water sweeps into the tank, carrying a quantity of silt with it at each flood, and breaching the tank at the northern end, sweeps across the ayacut of the tank into the Yerur tank. The floods also top the left bank of the Chellakalva below the off-take of the present supply-channel (A), and sweep across the ayacut into the Yerur tank.

The Yerur tank is ruined and its banks so badly breached that the Kandaleru has cut back into the Yerur tank and made its water brackish.

To remedy this state of affairs works as per plans and estimates now submitted are proposed. Briefly the works proposed are—

(1) to close the head of the present supply-channel so as to prevent floods sweeping in and damaging the tank, and in the place of the present supply-channel to excavate a new channel from above the anicut across the Chellakalva;

(2) to renew the bund at the northern end of the tank, which has hitherto been breached so badly that hardly any of it remains, and provide adequate means for carrying off the surplus water;

(3) to reconstruct the left flood-bank of the Chellakalva to a distance of $1\frac{1}{2}$ miles below the off-take of the old supply-channel so as to prevent floods topping the bank sweeping across the ayacut and damaging the crops.

To justify this large expenditure of Rs. 30,800, the irrigation under the tank will be increased by 1,561 acres (more could be irrigated if there was sufficient water, as the bed and ayacut of the ruined Yerur tank is 4,000 acres), yielding a revenue of 1,561 × 4 = 6,244 or 20 per cent. on the proposed outlay.

The water from the Kota Penaka tank to irrigate the new lands will be dropped into the madavu shown on sketch and carried by it to the Yerur tank-bed.

The amount of water required to irrigate (2,400 + 1,561) = 3,961 acres is 3,961 × 21,600 = 855·576 millions of cubic feet.

The average rainfall at Gúdúr, 16 miles to the west of Kota Penaka, is 28·62 inches (*vide* Rainfall Register attached). The catchment basin of the Kota Penaka tank is 25 square miles.

The total rainfall collected on this area will be—

$$25 \times 5{,}280 \times 5{,}280 \times \frac{28{\cdot}62}{12} = 1{,}662{\cdot}249 \text{ millions cubic feet.}$$

Taking one-eighth as the yield available for irrigation, we get = 207·781 millions of cubic feet.

The difference between 855·576 millions of cubic feet, the amount required, and 207·781, the yield of the catchment basin, must be made by the supply-channel from the river. There is no data to ascertain the average number of days in the year that the anicut surpluses, and the only information that can be got on this point is from the ryots in the neighbourhood.

From numerous inquiries made it was ascertained that on an average the anicut surpluses 35 days in the year. The channel therefore must supply 855·576 — 207·781 = 647·975 millions of cubic feet in 35 days, and the discharge must be $\frac{647{,}795{,}000}{35 \times 24 \times 60 \times 60}$ = 214 cubic feet per second.

The proposed new channel takes off from above an ancient anicut. The left wing of this anicut was some years ago out-flanked, and the water cut round it. The anicut was then extended and the old left wing cut down to crest level. The old portion of the anicut is fitted with upright stones and the ryots dam up the water, and hold it up to a level with the crest of the new extension. The anicut is founded on rock, and is a strong one; details of it are given in two tracings enclosed with the plans.

The scheme is a promising one, and the fact that, unless the proposed improvements are carried out, the tank will deteriorate and eventually be ruined must be taken into consideration. Early sanction for the proposed works is solicited.

NELLORE,
2nd November 1891.

(Signed) H. O'CONNELL,
Executive Engineer, Nellore Division.

From C. D. MACLEANE, Esq., Collector of Nellore, to the Executive Engineer, Nellore Division, dated 29th November 1891, No. 3488 Ver.

I have the honour to reply to your letter No. 1741, dated 2nd October 1891, that by the proposed repairs to Kota Penaka tank I anticipate an increased revenue of Rs. 7,948 as shown below:—

(1) Yerur tank—

	Extent.	Assessment.		
	ACS.	RS.	A.	P.
Occupied ayacut under the Yerur tank	814·29	3,112	1	0
Actually cultivated at present	74·0	210	0	0
Mamul waste ...	740·29	2,902	1	0
all which can be brought under irrigation if the proposed improvements are effected.				
Add additional extent of unoccupied waste which can also be irrigated	464·89	1,762	0	0
Total ...	1,208·18	4,664	1	0

(2) Kota Penaka tank—

	Extent.	Assessment.		
Revenue at present realized—				
Occupied wet	1,493·45	7,920	4	0
Teervajasti now levied	35·50	120	6	0
Faslijasti	88·50	187	7	0
Total ...	1,617·45	8,228	1	0

	Extent.	Assessment.		
	ACS.	RS.	A.	P.
Add additional revenue realizable if the improvements proposed are effected—				
Additional wet extent that can be brought under irrigation	294·0	1,470	0	0
Teervajasti realizable	50·0	200	0	0
Faslijasti	649·0	1,614	0	0
Total ...	993·0	3,284	0	0

2. . . . . .

No. 85 I.

The work is recommended for sanction.

2. As the work for "improving the Chellakalva left embankment" is "only required in connection with the Kota Penaka Tank Project," it should form part of that project and be charged to the same head and *not* to "Agricultural Works, River Embankments."

CHEPÂK,
23rd April 1892.

(Signed) G. T. WALCH,
Chief Engineer for Irrigation.

To the Joint Secretary to Government,
Public Works Department, Irrigation Branch.

ORDER—dated 29th April 1892, No. 416 I., Public Works.

The following estimates are sanctioned :—

Irrigation.
43. Minor Works and Navigation.
Minor Works for which neither Capital nor Revenue Accounts are kept, P.W.D.
Original Works.

	RS.
1. Improvements to the Kota Penaka tank, No. 235 of list of works in the Nellore division appended to G.O., No. 407 I., dated 6th July 1887	30,800
2. Improving the Chellakalva left embankment	8,300

2. This sanction is registered as No. 22 I. of 1892–93.

(True Extract.)

(Signed) G. T. WALCH,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, II Circle, with 64 enclosures.
" Examiner, Public Works Accounts.
" Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1892} Madras.

PUBLIC WORKS.

Dated April, 29th.

Recd. *Encl.*

G.O., 29th April 1892, No. 416 I.

APRIL.

Kota Penaka Tank

Estimates amounting respectively to Rs. 30,800 and Rs. 8,300 for improvements to the — and to the Chellakalva left embankment in the Nellore District, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

TABULAR STATEMENT OF MISCELLANEOUS PROCEEDINGS AND MATTERS OF ROUTINE.

IRRIGATION.

FOR THE MONTH OF APRIL 1892.

Subjects.	Number and Date of Order.	Numbers and Dates of previous Orders.
Periyár Project.—Copies of the Progress Report of Nos. I and II Periyár divisions for the month of February 1892, ordered to be forwarded to the Government of India.	1st April 1892, No. 343 I.	14th Nov. 1891, No. 879 I. 2nd Dec. 1891, Nos. 923–4 I. 21st Dec. 1891, No 991 I. 7th Jan. 1892, Nos. 22–3 I. 25th Feb. 1892, Nos. 194–5. 17th Mar. 1892, No. 1416 C.
Forwarded accordingly	1st do. do. No. 344 I.	......
Toddy producing trees.—Proceedings, Revenue Department, passing orders on the question of leasing out the usufruct of Government —, communicated to Superintending Engineers.	4th do. do. No. 348 I.	22nd Aug. 1889, No. 735 D. 24th Aug. 1889, No. 757 D. 20th Dec. 1889, No. 3621 W. 8th Jan. 1891, No. 21 I. 15th Jan. 1891, No. 45 I.
Irrigation disputes.—Letter from the Government of India inquiring when the views of this Government may be expected regarding — between the Government of Madras and the Mysore Durbar, recorded with reference to G.O., No. 299 I., dated 22nd March 1892.	4th do. do. No 349 I.	22nd Mar. 1892, Nos. 298–9 I.
Lands.—Notification for acquisition of — in the village of Penamakur required for the Kanakavalli drainage channel, in the Kistna district, ordered to be published in the *Fort St. George Gazette.*	5th do. do. No. 350 I.	......

Subjects.	Number and Date of Order.	Numbers and Dates of previous Orders.
Lands.—Notification for acquisition of certain — in Anicaipulli, Gúdúr taluk, Nellore district, required for extending field channels from Anicaipulli tank to irrigate Penubarthe lands, ordered to be published in the *Fort St. George Gazette.*	5th April 1892, No. 351 I.	......
Lands.—Notification for acquisition of certain — in Anicaipulli, Gúdúr taluk, Nellore district, required for extending field channels from Anicaipulli tank to irrigate Penubarthe lands, ordered to be published in the *Fort St. George Gazette.*	5th do. do. No. 352 I.	......
Lands.—Notification for acquisition of —, required in Inamadugur, Nellore taluk, for the Southern channel, &c., ordered to be published in the *Fort St. George Gazette.*	5th do. do. No. 353 I.	......
Land.—Notification for acquisition of — required for extending the Kapileswarapuram new channel in the Kistna district. ordered to be published in the *Fort St. George Gazette.*	5th do. do. No. 354 I.	......
Lands.—Notification for acquisition of — in Nadipally, Bhímavaram taluk, for the extension of the Muttema Codu drain, ordered to be published in the *Fort St. George Gazette.*	5th do. do. No. 355 I.	......
Grants.—Explanation from the Superintendent of Works, No. I Periyár division, for certain difference between the amount of — allotted for the division and that entered in the Progress Report, recorded	6th do. do. No. 356 I.	17th Mar. 1892, No. 1411 C. 6th Feb. 1892, No. 113 I. 29th Feb. 1892, No. 201 I. 22nd Mar. 1892, No. 1499 C.
Land.—Notification for acquisition of — required for the Gulleri channel, Head works, Rushikulya canal, ordered to be published in the *Fort St. George Gazette.*	8th do. do. No. 362 I.	......
Land.—Notification for acquisition of — required for widening the Western delta bank canal at Tummapudi, Kistna district, ordered to be published in the *Fort St. George Gazette.*	8th do. do. No. 363 I.	......
Provincial statement of objectionable items for 31st December 1891, IV Circle, appropriation.—Orders on the —.	9th do. do. No. 366 I.	5th Feb. 1892, No. 150 I. and file. 5th Feb. 1892, No. 98 I. 4th Mar. 1892, No. 220 I. 16th Mar. 1892, No. 260 I. 30th Mar. 1892, No. 328 I.
Provincial statement of objectionable items for 31st December 1891, I Circle, appropriation.—Orders on the —.	9th do. do. No. 367 I.	16th Feb. 1892, No. 156 I. and file. 18th Feb. 1892, No. 163 I.

Subjects.	Number and Date of Order.	Numbers and Dates of previous Orders.
Tank Restoration Scheme.—Letter to be forwarded to the Government of India regarding the necessity, under the new Provincial contract, of a reply to that Government on the subject of the financial effect of abandoning tanks irrigating less than 50 acres.	11th April 1892, No. 368 I.	26th Nov. 1891, No. 914 I. 28th Aug. 1891, Nos. 678 I.
Letter to the Government of India on the above subject.	11th do. do. No. 369 I.	......
Budget Estimates, Irrigation Branch.—Proceedings, Revenue Department, communicating to Collectors the Government Order regarding the — for "Major Works" and "Minor Works and Navigation" for 1892–93 and showing the distribution among districts of the amount sanctioned for the repair of Minor Irrigation Works, communicated to the Superintending Engineer.	12th do. do. No. 375 I.	9th Feb. 1892, Nos. 128-29 I. 18th Feb. 1892, No. 518 W.
Charge for water.—Proceedings, Revenue Department, recording Boards' Proceedings regarding the information to be furnished in the future annual irrigation accounts in connection with the average incidence of the — in certain systems of Irrigation works of the Madras Presidency, recorded.	13th do. do. No. 380 I.	......
Pambal channel.—The petitioners from the Valachary village, Saidápet taluk, informed that the investigations as to the restoration of the — have shown that their request cannot be complied with.	13th do. do. No. 381 I.	......
Minor Irrigation Works.—Proceedings, Revenue Department, reviewing the progress report of — up to the end of January 1892, recorded.	13th do. do. No. 382 I.	20th Feb. 1892, No. 174 I and file.
Lands.—Notification for acquisition of — required for the improvements of the Cheyár anicut channel in the villages of Kelapalandai, Vakadai and Kalanipakam, Wandiwash taluk, ordered to be published in the *Fort St. George Gazette.*	14th do. do. No. 386 I.	......
Funds.—Proceedings, Financial Department, considering the transfers of — for IV Circle, sanctioned in Public Works Department, Proceedings No. 301 I., dated 22nd March 1892, as unnecessary the official year having expired, and authorizing the officers of account to admit the excess over the total grant for the Presidency or for any district, communicated to officers concerned.	18th do. do. No. 387 I.	22nd Mar. 1892, No. 301 I.
Lands.—Notification for acquisition of — required for the new drainage channel from the Tirupápuliyúr flood embankment to the Gaddilam river in Eiruvendipuram village, Cuddalore taluk, ordered to be published in the *Fort St. George Gazette.*	20th do. do. No. 397 I.	......
Sekrail Cuthwa.—Informing the petitioners of Cumbum and its adjacent villages that an estimate has been sanctioned for sluices to hold up water where the — used to exist.	21st do. do. No. 398 I.	......

Subjects.	Number and Date of Order.	Numbers and Dates of previous Orders.
Masonry beams.—Letter from the Government of North-Western Provinces and Oudh forwarding 2 copies of erratum on report by Mr. W. R. Williams, Assistant Engineer, on experiments made on strength of — in the Nadrai aqueduct division, Lower Ganges canal, recorded.	21st Apr. 1892, No. 399 I.	12th Jan. 1892, Nos. 38-9 I. 25th Mar. 1892, No. 315 I.
Sakina Bi Bi.—Informing petitioner — that her request that the Government should carry out the repairs to such portions of her building as have been destroyed by the Red Hills tank channel, &c., cannot be complied with.	25th do. do. No. ~~400 I.~~ 402 I	6th Jan. 1881, No. 6 I. 10th May 1881, No. 309 I. 12th Dec. 1884, No. 1114 I. 10th Dec. 1884, No. 2230 D. 12th Aug. 1887, No. 426 D. 12th Dec. 1884, No. 1122 I. 12th Feb. 1885, No. 154 I. 19th Feb. 1885, No. 335 C. 27th Mar. 1885, No. 323 I. 5th Mar. 1885, No. 229 I. 12th Mar. 1885, No. 263 I. 26th Jan. 1886, No. 80 I. 18th July 1885, No. 613 I. 16th Nov. 1891, No. 882 I.
Land.—Notification for acquisition of — in Eachampundi and Old Puthur villages, Chidambaram taluk, taken up for the excavation of a channel from Ammulidevan sluice to Eachampundi channel, ordered to be published in the *Fort St. George Gazette.*	25th do. do. No. 403 I.	......
Lands.—Notification for acquisition of certain — required for the Russellkonda and the Suráda reservoir works in the Ganjam district, ordered to be published in the *Fort St. George Gazette.*	25th do. do. No. 404 I.	......
Lands.—Notification for acquisition of — in the villages of Mukkani and Korkai, Tinnevelly district, required for the realignment of the left flood bank of the Tambrapárni river, ordered to be published in the *Fort St. George Gazette*, in supersession of the Notification published in February 1890.	25th do. do. No. 405 I.	......
Lands.—Notification for acquisition of — required in the Kistna district for some irrigation purposes, ordered to be published in the *Fort St. George Gazette.*	25th do. do. No. 406 I.	......

Subjects.	Number and Date of Order.	Numbers and Dates of previous Orders.
Misprints.—Copy of the office-note from the Examiner of Public Works Accounts pointing out for necessary action certain — in the copy of his office-note embodied in G.O., No. 308 I., dated 25th March 1892, in connection with the statement showing the financial results of irrigation operations throughout India for 1890–91, ordered to be forwarded to the Government of India.	28th Apr. 1892, No. 413 I.	25th Mar. 1892, No. 308 I.
Forwarded accordingly	28th do. do. No. 414 I.	......
Memorial.—Orders on the — (paras. 1, 8 and 9) to His Excellency the Governor of Madras from the ryots of Moheri taluk, Ganjam district, regarding the draining of a tampara, &c.	29th do. do. No. 417 I.	4th Mar. 1892, No. 215 I.